THE JOURNAL
of the
Kansas Medical Society

VOL. XXXII TOPEKA, KANSAS, MAY, 1931 No. 5

Published Monthly under direction of the Council. Annual Subscription, $2. Single Copy, 20c.
700 Kansas Avenue, Topeka, Kansas

Entered as second-class matter May 2, 1914, at the Postoffice at Topeka, Kansas, under the Act of March 3, 1879. Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. authorized on July 2, 1918.

CONTENTS

ORIGINAL ARTICLES

Myxedema—Difficulties of Diagnosis—Difficulties of Treatment—Logan Clendening, M.D. 155
Dermoid Cyst of Ovary Combined With Large Pseudo-mucinous Cysts—Ralph R. Wilson, M.D., T. J. Sims, M.D. 151
Notes on Pyelitis—Nelse F. Ockerblad, M.D., F.A.C.S.. 149
The Early Diagnosis and Treatment of Acute Anterior Poliomyelitis—B. Landis Elliott, M.D., Carl R. Ferris, M.D., and Paul F. Stookey, M.D. 145
Fractures of the Femur—C. B. Francisco, M.D..... 158
Water and Salt in Surgery—Thomas G. Orr, M.D..... 159
The Hemoglobin Standard—C. F. Nelson, M.D..... 162
Obstruction of Small Intestine Due to Neoplasm—C. C. Nesselrode, M.D. 165
The Position of Surgery and Radium in the Treatment of Oral Cancer—Earl C. Padgett, M.D. 167
Tribromethyl Alcohol (Avertin) As a Rectal Anesthetic —Lewis W. Angle, M.D. 172
Tuberculosis Abstracts 176
Medical School Notes 178

EDITORIAL

The Crippled Children's Law of Kansas 179
Societies 180

Mead Johnson & Company have to depend upon the physician to specify MEAD'S because they do not advertise their products to the public, either directly or through merchandising channels.

"It is worth while specifying Mead's"

The Unspecified Prescription

Some physicians are averse to specifying the maker's name on a prescription.

On the other hand, a physician of international reputation and unimpeachable ethical standing has expressed himself as follows:

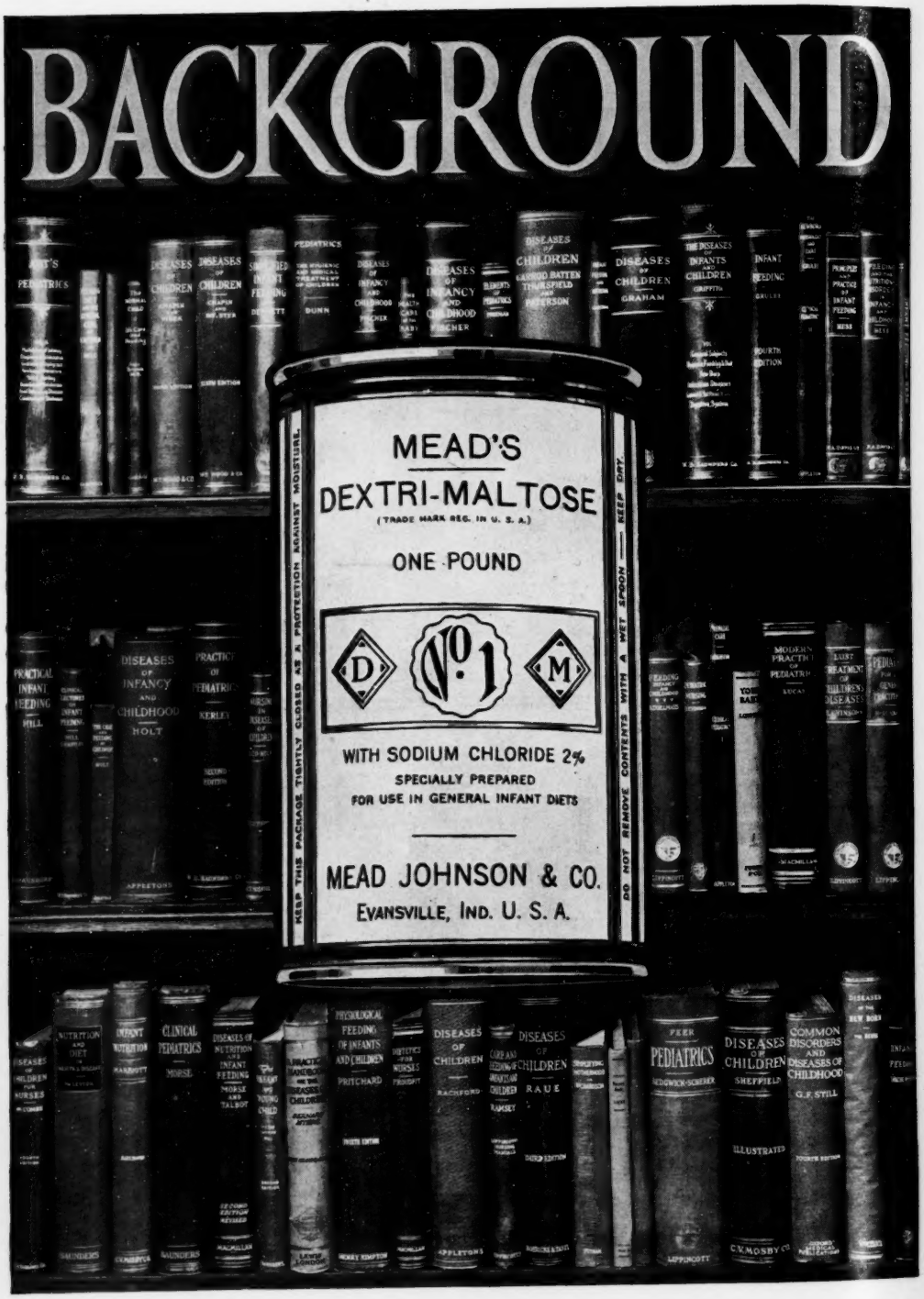
"I invariably specify Mead's whenever I can, for I feel that when I don't specify a definite brand, the effect may be the same as though I were to specify that *any brand would do.*

"By not specifying, I let down the bars to a host of houses, many entirely unknown to me and others deserving no support at my hands.

"When I specify Mead's, I may be guilty of showing favoritism, but I at least know that I am protecting my results. If, at the same time, my self-interested act encourages some worthy manufacturer to serve me better, I can see no harm in that."

MEAD'S 10 D COD LIVER OIL WITH VIOSTEROL; MEAD'S STANDARDIZED COD LIVER OIL; MEAD'S VIOSTEROL IN OIL, 250D; MEAD'S DEXTRI-MALTOSE NOS. 1, 2 AND 3; MEAD'S DEXTRI-MALTOSE WITH VITAMIN B; MEAD'S CEREAL

KANSAS STATE LIBRARY MAY 1 1931



THE use of cow's milk, water and carbohydrate mixtures represents the one system of infant feeding that has consistently, for three decades, received universal pediatric recognition. No carbohydrate employed in this system of infant feeding enjoys so rich and enduring a background of authoritative clinical experience as Mead's Dextri-Maltose.

the Squibb Laboratories Announce

SCHICK TEST SOLUTION

Diluted . . . Ready for Use

Physicians will be interested in the announcement that Diphtheria Toxin for Schick Test is now available in a new form—ready to use—without troublesome dilution and without waste.

The **original** Squibb Schick Test for 50 and 100 tests contained two vials—one of the concentrated Diphtheria Toxin, the other of the sterile salt solution for dilution. The contents of these two vials had to be mixed just before using.

The **new** Squibb Schick Test Solution is ready for use **when opened.** It is supplied in a 10-test package, which is economical when only a few patients are to be tested. A one hundred test package is also available.

For further information write Professional Service Department, 745 Fifth Avenue, New York City

OTHER SQUIBB DIPHTHERIA PRODUCTS

Diphtheria Toxin-Antitoxin Mixture Squibb (prepared with diphtheria antitoxin from sheep). For active immunization against diphtheria. Eliminates any possibility of sensitizing a patient to horse serum.

Diphtheria Toxoid Squibb (Anatoxin Ramon) a modified toxin for active immunization.

Diphtheria Antitoxin Squibb — Highly purified and concentrated. Remarkably free from reaction-producing proteins.

E·R·SQUIBB & SONS, NEW YORK

MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858.

MORTON E. BROWNELL, M.D.
Practice limited to Ophthalmology
1019 1st National Bank Bldg.
Wichita, Kansas

FRANK C. BOGGS, M.D.
Eye, Ear, Nose and Throat
Mills Building — Topeka, Kansas

E. S. EDGERTON, M.D.
Surgeon
Suite 910 Schweiter Bldg. — WICHITA, KANSAS

W. F. BOWEN, M.D.
MILTON B. MILLER, M.D.
SURGEONS
212 Central Bldg., 700 Kansas Ave.
Telephone 6120 — Topeka, Kansas

OPIE W. SWOPE, M.D.
RADIOLOGIST
Superficial and Deep x-Ray Therapy
Radium Therapy x-Ray Diagnosis
713 First National Bank Bldg.
WICHITA, KANSAS

FRANK FONCANNON, M.D.
SURGEON
405-6 Citizens Bank Bldg. — Emporia, Kansas

LESLIE LEVERICH, M.D., F.A.C.S.
Practice limited exclusively to Obstetrics
Normal and Operative
430 Brotherhood Bldg., — Kansas City, Kansas

DR. S. T. MILLARD
Practice Limited to
DERMATOLOGY
Nat'l Reserve Life Bldg. — Topeka, Kansas

J. A. H. WEBB, M.D.
X-RAY
310 Schweiter Bldg. — Wichita, Kansas

T. E. HORNER, M.D.
Obstetrics
HOSPITAL FACILITIES 206-7 Simpson Bldg.
Atchison, Kansas

NELSE F. OCKERBLAD, M.D., F.A.C.S.
Practice limited to Urology
Complete cystoscopic room and x-ray in office.
1530 Professional Building
Kansas City, Mo. — Tel. Harrison 3331

X-Ray and Radium
LEWIS G. ALLEN, M.D.
Phone Drexel 2960 — Suite 704 Commercial National Bank Bldg., Kansas City, Kansas

WALTER H. WEIDLING, M.D.
OBSTETRICS and
GYNECOLOGY
700 Kansas Avenue — Topeka, Kansas

DR. LA VERNE B. SPAKE
EYE, EAR, NOSE and THROAT
322 Brotherhood Bldg., — Kansas City, Kansas

Arthur D. Gray, M.D.
Ernest H. Decker, M.D.
DRS. GRAY AND DECKER
Urology, Dermatology and Allied Diseases
Radium and x-Ray Therapy
Suite 721-723
Mills Bldg. Topeka, Kansas

J. G. MISSILDINE, M.D.
Urologist Dermatologist
906 Brown Bldg.
Wichita, Kansas

RAYMOND G. HOUSE, M.D.
Practice limited to
DERMATOLOGY
405 Schweiter Bldg., Wichita, Kansas

E. A. REEVES, M.D.
OBSTETRICS and GYNECOLOGY
Hospital Facilities
322 Brotherhood Bldg., Kansas City, Kansas

W. J. EILERTS, M.D.
SURGEON
Suite 809 Schweiter Bldg.
Wichita, Kansas

OFFICIAL NURSES' REGISTRY
Registered Nurses' Directory of District No. 1, Kansas State Nurses Association
Felicitas Dyer, R.N., Registrar
715 West 5th Street
Telephone 2-2259 Topeka, Kansas

G. W. JONES, A.M., M.D.
Diseases of the Stomach. Surgery and Gynecology
RADIUM USED AND FOR RENT
LAWRENCE HOSPITAL AND TRAINING SCHOOL
Phone 35 or 1745 Lawrence, Kansas

ALFRED O'DONNELL, M.D.
Surgeon
ELLSWORTH, KANSAS

J. F. HASSIG, M.D.
SURGEON
804 Huron Bldg. Kansas City, Kansas

C. S. NEWMAN, M.D.
SURGEON
615 N. Broadway Pittsburg, Kansas

GEO. E. COWLES, M.D.
OBSTETRICS and GYNECOLOGY
902 Brown Bldg. Wichita, Kansas
Office Telephone 2-2404 Residence Telephone 3-8097

CLAUDE C. TUCKER, M.D.
Practice Limited to Diseases of Rectum and Sigmoid colon
1003 Schweiter Bldg.
Phone Douglas 2449 Wichita, Kansas

LAIN-ROLAND CLINIC
Dermatology, Radium and X-Ray Therapy
Medical Arts Building
Oklahoma City, Okla.
EVERETT S. LAIN, M.D., F.A.C.P. MARION M. ROLAND, M.D.
WM. E. EASTLAND, B.S., M.D. CHAS. E. DAVIS, M.D.
DARRELL G. DUNCAN, B.S., M.D.

THE JANE C. STORMONT HOSPITAL
TOPEKA, KANSAS
Training School for Nurses
General Hospital—75 Beds
Medical, Surgical and Obstetrical Cases Received.

THE

Lattimore Laboratories

J. L. LATTIMORE, A.B., M.D., Director

**ROUTINE ANALYSES, SEROLOGY,
BACTERIOLOGY, PATHOLOGY, PARASITOLOGY
BLOOD CHEMISTRY
COMMERCIAL CHEMISTRY**

**Solutions of Any Kind Made From Your Specifications.
Intravenous Solutions, Glucose, Mercurochrome, Etc.**

Containers furnished upon request. Wire report if desired.

A. C. KEITH, Chemist-Toxicologist

Topeka, Kansas	El Dorado, Kansas	Sedalia, Mo.	McAlester, Okla.
J. L. Lattimore	J. C. McComas	R. C. Carrel	W. J. DELL

Adult Feeding

Ulcer

(No-residue diet)

ACCEPTED AMERICAN MEDICAL ASSN.

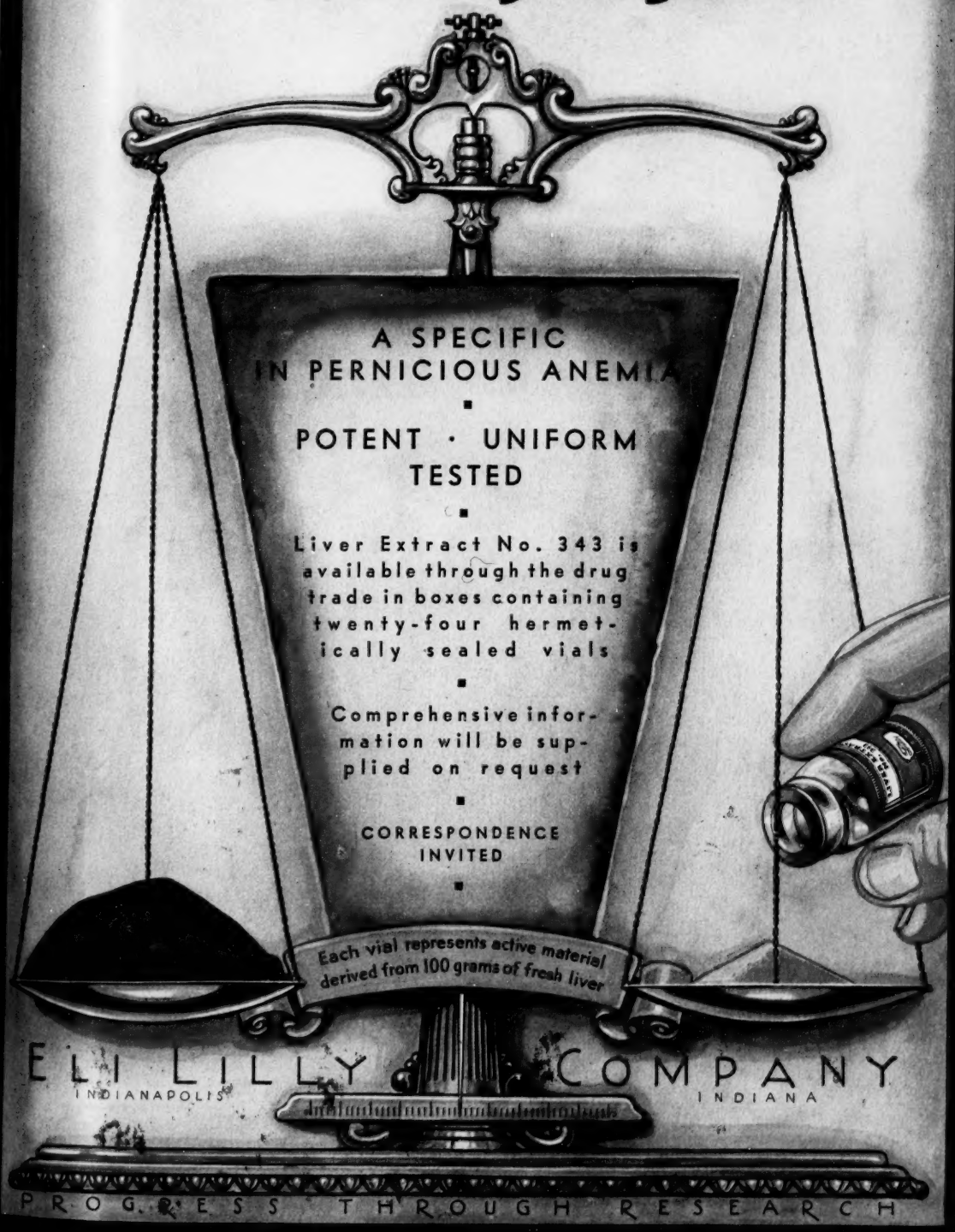
Mellin's Food	*4 tablespoonfuls*
Water	*1 cupful*

Dissolve the Mellin's Food in the water by stirring briskly (no cooking required). To be given cold or warm, not hot.

In serious disturbances of the stomach or intestine and particularly where gastric or duodenal ulcer is present or suspected, nourishment prepared as above is of special value on account of its being capable of rapid and complete assimilation. Distress from hyperacidity is promptly relieved by giving the above mixture.

Mellin's Food Company, Boston, Mass.

LIVER EXTRACT NO. 343


A SPECIFIC
IN PERNICIOUS ANEMIA
POTENT · UNIFORM
TESTED
Liver Extract No. 343 is available through the drug trade in boxes containing twenty-four hermetically sealed vials
Comprehensive information will be supplied on request
CORRESPONDENCE INVITED
Each vial represents active material derived from 100 grams of fresh liver

ELI LILLY COMPANY
INDIANAPOLIS INDIANA

PROGRESS THROUGH RESEARCH

EPHEDRINE
PRODUCTS
LILLY

Noteworthy in a wide range of Lilly Ephedrine Products are

INHALANT No. 20
EPHEDRINE COMPOUND

for those physicians who prefer ephedrine in combination with cooling, aromatic principles

INHALANT No. 21
EPHEDRINE, PLAIN

and the convenient bland, water-soluble

EPHEDRINE JELLY

Both inhalants contain 1 percent ephedrine. Ephedrine Jelly contains ephedrine sulphate, 1 percent.

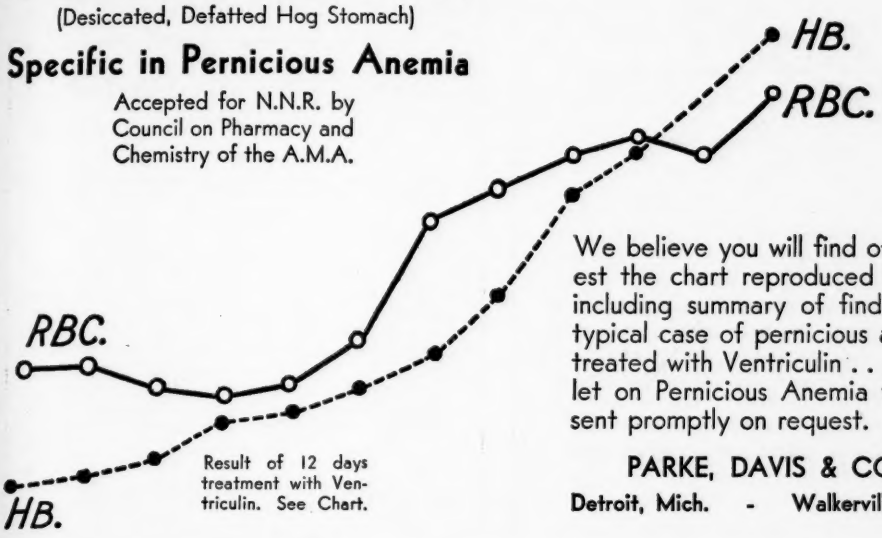
May we send you additional information and a complete list of Lilly Ephedrine Preparations?

VENTRICULIN

(Desiccated, Defatted Hog Stomach)

Specific in Pernicious Anemia

Accepted for N.N.R. by Council on Pharmacy and Chemistry of the A.M.A.

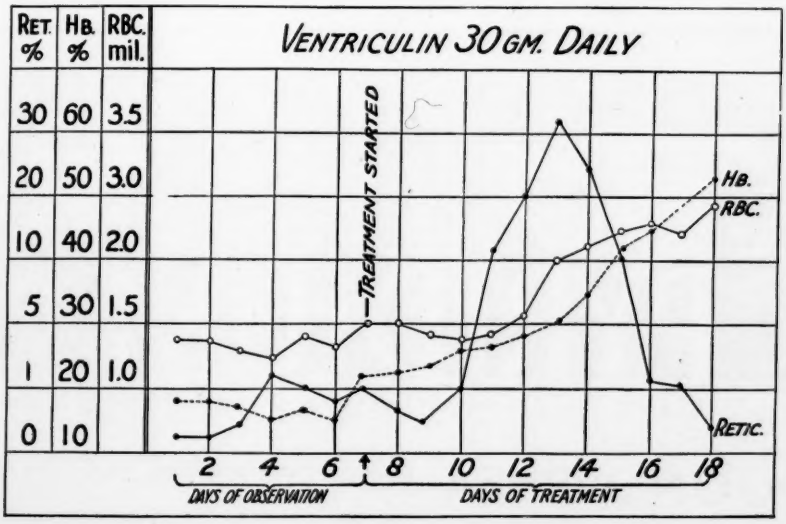


Result of 12 days treatment with Ventriculin. See Chart.

We believe you will find of interest the chart reproduced below, including summary of findings in typical case of pernicious anemia treated with Ventriculin . . . Booklet on Pernicious Anemia will be sent promptly on request.

PARKE, DAVIS & CO.

Detroit, Mich. - Walkerville, Ont.



DIAGNOSIS. Pernicious anemia.

INITIAL BLOOD COUNT: Red blood cells 1.5 million per cu. mm.; Hemoglobin (Newcomer) 21 per cent; Reticulocytes 1.0 per cent.

TREATMENT. Ventriculin 30 Gm. daily.

PHASE OF REMISSION. On sixth day of treatment: RBC 2.0 million; Hemoglobin (Newcomer) 30 per cent; Reticulocytes 32.0 per cent (calculated rise for 1.5 million red blood cells at beginning of treatment = 22.3 per cent, exceeding expected rise by 9.7 per cent).

PROGRESS REPORT. On the twelfth day after Ventriculin was begun the following blood count was recorded: RBC 2.9 million; Hemoglobin 52 per cent; Reticulocytes 0.4 per cent. (Expected weekly increase = 500,000 red blood cells per cu. mm. Actual increase in this patient = 700,000 red blood cells per cu. mm.).

Green Gables
THE
DR. BENJ. F. BAILEY
SANATORIUM
Lincoln, Neb.

This institution is the only one in the Central West with separate buildings situated in their own ample grounds, yet entirely distinct and rendering it possible to classify cases. The Main Building being fitted for and devoted to the treatment of non-contagious and non-mental diseases, no others being admitted. The other, Rest Cottage, being designed for and devoted to the exclusive treatment of select mental and nervous cases requiring for a time watchful care and special nursing.

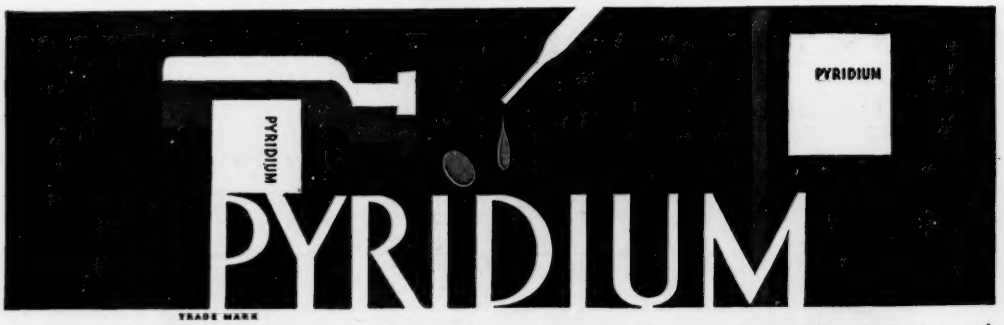
Send For Illustrated Pamphlet

Mercurochrome—
220 Soluble
(Dibrom-oxymercuri-fluorescein)

THE STAIN PROVIDES FOR PENETRATION
and
FIXES THE GERMICIDE IN THE TISSUES

Mercurochrome is bacteriostatic in exceedingly high dilutions and as long as the stain is visible bacteriostasis is present. Reinfection or contamination are prevented and natural body defenses are permitted to hasten prompt and clean healing, as Mercurochrome does not interfere with immunological processes. This germicide is non-irritating and non-injurious when applied to wounds.

Hynson, Westcott & Dunning, Inc.
Baltimore, Maryland



PHENYLAZO-ALPHA-ALPHA-PYRIDINE-MONO-HYDROCHLORIDE (MANUFACTURED BY THE PYRIDIUM CORPORATION)

FOR GONORRHEA

The oral administration of Pyridium in tablet form affords a quick and convenient method of obtaining bactericidal action when treating Gonorrhea and other chronic or acute genito-urinary infections... Pyridium penetrates quickly through denuded surfaces and mucous membranes and is rapidly eliminated through the urinary tract. It is non-toxic and non-irritating in therapeutic doses... Pyridium is available in four convenient forms, as tablets, powder, solution or ointment.

WRITE FOR LITERATURE

"COUNCIL ACCEPTED"

M.E.R.C.K. & CO. INC.
MANUFACTURING CHEMISTS
RAHWAY, N. J.

The Defense Fund

OF THE
KANSAS
MEDICAL SOCIETY

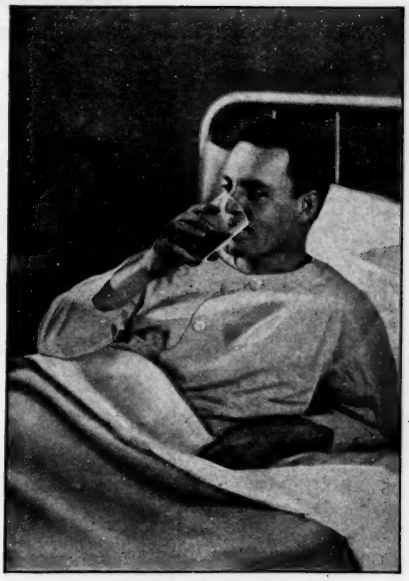
For the Defense of a Member Against Suits for Alleged Malpractice

The regular annual dues cover all expense to members.

Furnishes expert legal advice and defense.

Pays all expenses for defense suit.

Chairman, Dr. O. P. Davis,
917 N. Kan. Ave. Topeka, Kan
Dr. W. F. Fee, Meade, Kan.
Dr. C. S. Kenney, Norton, Kan.



For *hyper-nutrition* in post-operative cases

A delicious food drink—easily digested—quickly metabolized

DOCTORS have been quick to discover in Cocomalt a high caloric food of ready digestibility, ideal in post-operative cases.

This delicious chocolate-flavor food drink imposes no strain upon the digestive system. It meets the demand for a highly nutritious food that does not produce stasis. Cocomalt greatly aids digestion by helping to digest the starches of other foods.

A scientific food-concentrate

Cocomalt is a balanced combination of milk protein, milk minerals, concentrated cocoa, sugar, barley malt and whole egg. Made as directed, it increases the caloric value of a glass of milk 72%—adding 40% more protein, 56% more mineral salts, 188% more carbohydrates, *but only* 12% *more fat.*

Cocomalt contains Vitamin A, Vitamin B complex, and Vitamin D. Especially valuable for growing children, convalescents, nursing and expectant mothers. At all grocery and leading drug stores. Mail coupon for *free* trial can.

Cocomalt

DELICIOUS HOT OR COLD

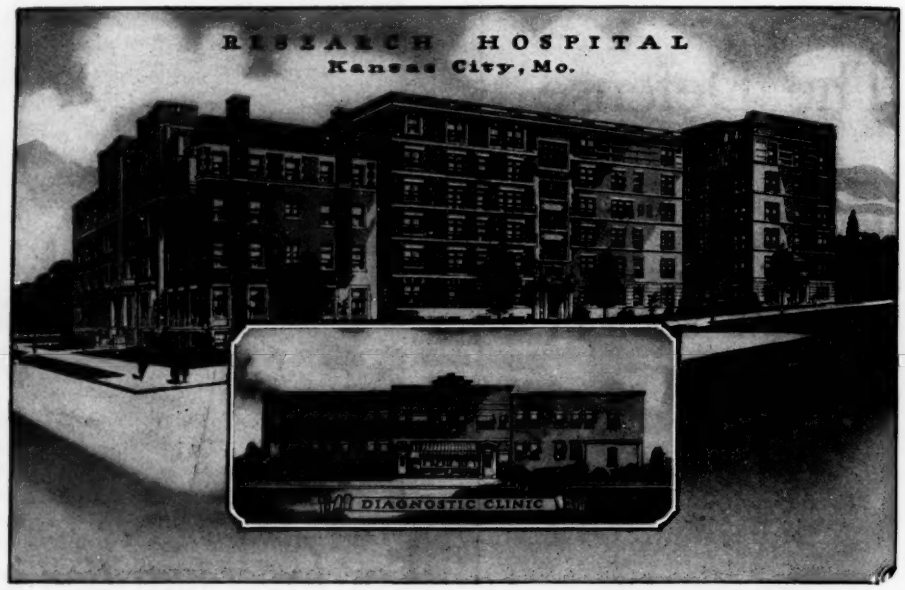
ADDS 70% MORE NOURISHMENT TO MILK

R. B. DAVIS CO., Dept. AJ-5 Hoboken, N. J.
Please send me, without charge, a trial can of Cocomalt.

Name _____

Address _____

City _____ *State* _____



The Diagnostic Department of Research Hospital

The Diagnostic Department of Research Hospital was established in November, 1924. Patients are received for diagnosis from reputable physicians. On completion of examinations, reports, which include the patient's history, physical examination, laboratory and X-ray reports, the findings of various specialists and the final diagnosis with recommendations for treatment, are sent to the patient's physician—in no instance will reports be given to patients. The fee includes all necessary tests and examination. The following departments are represented:

Medicine, Surgery, Orthopedics, Neurology, Oto-Rhino-Laryngology, Ophthalmology, Urology, Dermatology, Gynecology, Obstetrics, Radiology, Pathology, and Electrocardiography.

For further information address:

THE DIAGNOSTIC DEPARTMENT OF RESEARCH HOSPITAL

23rd and Holmes Sts., Kansas City, Mo.

ANATOMICAL STUDIES

SUPERFICIAL MUSCLES IN THE FEMALE
LATERAL VIEW

for the Practitioner

Sets of Anatomical Studies (in book form) furnished to physicians on request — upon receipt of 20c to cover mailing costs.

CAMP

Physiological Supports
Scientifically Designed

S. H. CAMP & COMPANY
Manufacturers
JACKSON, MICHIGAN

Chicago
1056 Merchandise Mart

New York
330 Fifth Ave.

London
252 Regent St. W.

Founded 1896 by Dr. Hubert Work

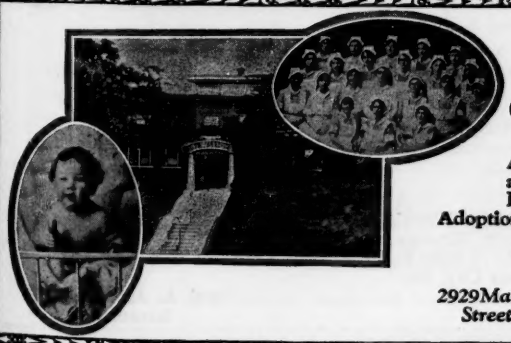
WOODCROFT HOSPITAL. PUEBLO, COLO.

New Buildings
New Equipment
Neuro-Psychiatric Clinic

NERVOUS AND MENTAL DISEASES

Drug Addictions

H. A. La Moure, M.D.
Superintendent



The Willows
Maternity Sanitarium
ESTABLISHED 1905

A privately operated seclusion maternity home and hospital for unfortunate young women. Patients accepted any time during gestation. Adoption of babies when arranged for. Prices reasonable.

Write for 90-Page Illustrated Booklet

2929 Main Street — The Willows — Kansas City, Mo.

JAMES Y. SIMPSON, M.D.,
Neurologist and Addictologist

HERMON S. MAJOR, M.D.,
Neuro-Psychiatrist

SIMPSON–MAJOR SANITARIUM

3100 Euclid Avenue, Kansas City, Mo.

Nervous Diseases. Selected Mental Cases. Alcohol Drug and Tobacco Addictions

Electricity
Heat
Water
Light
Exercise
Massage
Rest
Diet
Medicine

Beautifully situated in a pleasant residence section of the city. Fully equipped and well heated. All pleasant outside rooms. Large lawn and open and closed porches for exercises. Experienced and humane attendants. Liberal, nourishing diet. Resident physician in attendance day and night.

THE ROBINSON CLINIC

The treatment of dementia paralytica (paresis) has always been more or less hopeless. Arsenicals, mercury and intraspinal treatment had, for years, been the only aproach. Malarial therapy was introduced in 1918 and there is no doubt that it is an advance, as thirty-three per cent of the patients have clinical remissions; but the mortality rate is high. Typhoid vaccine was introduced in 1927, and has the advantage of being controllable. All forms of fever therapy are an advance.

In 1930, Neyman, et al, reported the use of generalized diathermy to produce fever, and their results were highly satisfactory; they claim over sixty per cent clinical remissions and, most encouraging, no deaths in their series.

The Robinson Clinic has purchased generalized diathermy equipment, and our results, to date, have been very satisfactory. Our series of cases is progressing nicely, and soon we hope to report our results.

In consideration of the financial conditions in parts of the Southwest, we have recently reduced our rates for hospital care, in order to better serve the profession, whenever possible.

—Courtesy Curtiss-Wright Flying Service

Nervous and Mental Diseases

G. WILSE ROBINSON, M.D.
Medical Director
1432 Professional Bldg. 8100 Independence Road
Kansas City, Mo.

Drug and Alcohol Addiction

G. Wilse Robinson, Jr., M.D.
Assoc. Medical Director

Paul A. Johnson, M.D.
Internist

Just think of the convenience—Two X-Ray Tubes in One!

(Right) Cathode, showing double filament mounting

Roentgenologists acclaim the Double Focus Coolidge Tube

DESCRIBED in the simplest terms, the Double Focus Coolidge Tube is, as its name implies, one tube in which either of its two focal spots is instantly available.

Which means that the radiographic advantages formerly obtained with the use of two Radiator type tubes, 10 Ma. and 100 Ma., respectively, are now to be had with a single tube.

Think of the added convenience with this tube in routine radiography, when you may select as between the use of a fine or a broad focal spot, without the necessity of changing tubes in the holder, nor the attendant danger of breakage. Simply throw the small switch at the cathode end of the tube, and you are ready to proceed.

In short, here is a tube which covers practically the entire range of routine radiography, as may be seen in the following table of its capacity ratings:

	Kv. P.	Ma.	Sec.
Small Focal Spot	85	30	½
	85	20	4½
	100	10	45
	100	20	2½
Large Focal Spot	100	50	9½
	85	50	12½
	100	75	3
	100	100	½
	75	100	3

We'll gladly send further information upon request.

$175 *f. o. b. Chicago*

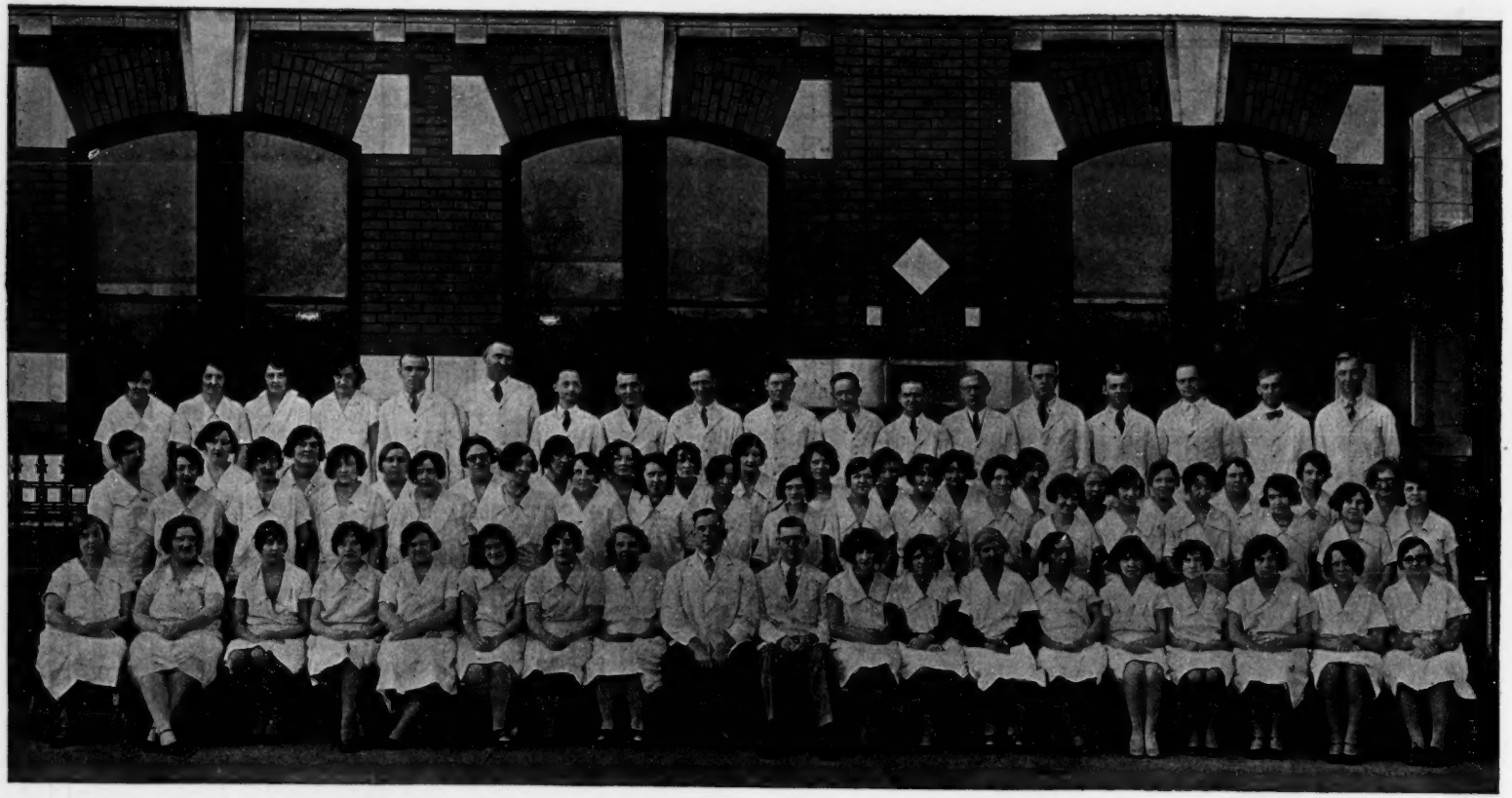
Kansas City, Mo., 208 Y. W. C. A. Bldg.

GENERAL ELECTRIC X-RAY CORPORATION

2012 Jackson Boulevard *Branches in all Principal Cities* Chicago, Ill., U. S. A.

FORMERLY VICTOR X-RAY CORPORATION

Join us in the General Electric program, broadcast every Saturday evening over a nation-wide N. B. C. network



TESTING, assaying, and standardizing Lilly Pharmaceuticals and Biologicals is the responsibility of the control laboratories which supervise each step of manufacturing.

It is the duty of the seventy-three inspectors portrayed above to see that Lilly Pharmaceuticals and Biologicals are properly packaged and labeled true to content. This inspection staff has been selected from experienced employees who have shown by tests that they are naturally vigilant, accurate, and otherwise adapted to this exacting work.

In specifying "Lilly" you are designating products made from the finest of carefully selected and tested crude materials by the most approved manufacturing processes and packaged under safeguards that assure you and your patients just what you ordered.

THE JOURNAL
of the
Kansas Medical Society

VOL. XXXII TOPEKA, KANSAS, MAY, 1931 No. 5

The Early Diagnosis and Treatment of Acute Anterior Poliomyelitis

B. Landis Elliott, M.D.
Carl R. Ferris, M.D.
Paul F. Stookey, M.D.
Departments of Neurology and Medicine

Poliomyelitis is a disease so dreaded by the public and by physicians alike for its tragic sequellae that anything we can do to improve our ability to diagnose and treat it early is well worth while. The lay public and especially parents of children have been educated to some extent along this line in recent years and expect more of us in this direction than they formerly did.

It is our object in this brief study to inquire to what extent these expectations are justified and what are our limitations in this direction and also to ascertain what can be done to prevent the onset of paralysis, assuming that we are able to make a diagnosis of poliomyelitis in the pre-paralytic stage. In other words, what can the public rightfully demand of its physicians in the detection of poliomyelitis in the pre-paralytic stage and in the prevention of paralysis?

Poliomyelitis is endemic in certain parts of the United States, becoming epidemic at certain times. It is the consensus of opinion among students of the disease that many cases of poliomyelitis in epidemics go unrecognized because the disease manifests itself sometimes by vague systemic disturbances which are not characteristic, and, unless paralysis occurs, cases of this kind cannot be diagnosed. Osler speaks of abortive cases which would not arouse suspicion but for the presence of other cases in a community, and mentions the fact that immune bodies have been demonstrated in the blood serum of such cases. The existence of such cases may account for the ineffectiveness of quarantine and prophylactic measures generally.

If the systemic symptoms are so mild at the beginning or of such short duration that the paralysis is the first thing to attract attention, then of course such a thing as diagnosis in the pre-paralytic stage is impossible. In a not inconsiderable group of cases, however, there is a period of one to four days preceding the paralysis during which certain symptoms and signs appear which make a diagnosis possible provided they are properly evaluated.

For our purpose, poliomyelitis cases can be divided into three groups: (1) Cases with symptoms not characteristic, which never develop paralysis and go unrecognized; (2) Cases in which the systemic symptoms are so indefinite that they are not recognized or so mild that they are missed altogether, and in which diagnosis therefore is not made until the onset of paralysis; (3) Cases with a fairly characteristic syndrome in which certain signs of meningeal irritation precede the paralysis.

In this latter group diagnosis in the pre-paralytic stage is possible and should be attempted. This report is based in part upon 28 cases of acute anterior poliomyelitis observed at the Kansas City General Hospital and Bell Memorial Hospital during the summer and fall of 1930, as well as upon our experience. We found in the histories of our cases that the symptoms which preceded the onset of paralysis were usually fever, headache, gastro-intestinal disturbance, with vomiting, often constipation, frequently pains in the muscles, stiffness in the neck, and reflex changes. The above were the principal symptoms. Muscular twitching was occasionally reported, while such things as redness or soreness of the throat, dizziness, weak-

ness, convulsions and nystagmus and rash were only very occasional.

It is evident, of course, that a combination of headache, fever, vomiting and constipation may occur with almost any acute infectious disease. When muscular pains and stiffness of the neck occur, however, in combination with the above named symptoms, and especially if disturbances of the reflexes are present, a lumbar puncture should be done at once.

One of our early cases was a boy six years of age who became ill, with fever, headache and gastro-intestinal disturbance. His mother took him to the family doctor the next day at noon. Upon examination, not only the physician but also the mother noticed the great increase in the knee jerks. The same evening at 7 o'clock he was again taken to the doctor by his mother, as he seemed worse. At this time the mother, as well as the physician, was very much impressed with the fact that the knee jerks were almost gone. He was seen by one of us, and a spinal puncture was advised, and a clear fluid under pressure was obtained. The cell count was normal. The patient nevertheless was given human serum intraspinally and intramuscularly, and his symptoms all disappeared within the next three days. No paralysis occurred. On account of the fact that there was no increase in cells in the spinal fluid, we were in doubt for a while as to the true nature of this case. However, we subsequently saw another case in which the same sort of a spinal fluid picture was followed by an extensive paralysis.

The fever usually ranges from 100 to 102 degrees (rectal), although occasionally it is seen in uncomplicated cases to rise as high as 104 or 105. The leucocyte count varies greatly. In our series of cases, 23 of which had blood counts, the lowest was 6,750 and the highest was 19,800. The average count was 11,437, and in 61 per cent the blood counts were between 9,000 and 15,000. The white blood count does not parallel the fever level. In one case, on the same day that the temperature was 104 the white blood count was 6,800, while in another case, with a temperature of 99.6 the blood count was 19,500. We have not found that the leucocyte count is of any particular value in differential diagnosis, and if it is in the neighborhood of 20,000, it may be positively confusing, as it may lead one to suspect epidemic meningitis.

The spinal fluid cell count shows almost as much variability within certain limits. It may be counted from normal to 200 cells in most cases. In our present small series it was found to be above that figure in only 4 cases. In a study of 117 cases reported (Human Cerebro-Spinal Fluid) 15 per cent of the fluids showed cell counts under 10 per cu. mm. and 88 per cent under 200 per cu. mm. In the same series it was noted that the number of cells ranged from 20 to 1800 in the first week and from 12 to 567 the second week. The cell count gradually returned to a normal figure by the fourth week of the disease, although elevated counts occurred as late as the seventh week in exceptional cases. In the pre-paralytic stage the polymorphonuclear cells are said by some writers to be found at times in a greater percentage than the mononuclear type. In a study of 2000 fluids examined on various days Neal found this to be true in only 39 cases. None of our pre-paralytic cases showed more than 25 per cent polymorphonuclear cells, except one, an adult, who several hours preceding paralysis had a cell count of 660 and differential of polys 45 per cent and mononuclear cells 55 per cent. Lyon states that a clear spinal fluid containing 50 per cent or more of multilobed cells is suggestive of acute poliomyelitis infection and that when in the course of from twenty-four to thirty-six hours the lumbar puncture is repeated and there is a fall in the total cell count with a shifting of the differential count to a mononucleosis of 90 per cent or more, one may be certain that the condition is one of poliomyelitic infection. This cellular response, he states, is pathognomonic, as it has not been observed in the spinal fluid in other conditions. Because of rapid cytolysis counts made from spinal fluids more than an hour or two old will be inaccurate.

The pressure of the spinal fluid is usually recorded from normal to 30 or 40 mm. of mercury. In our series one case, that of a child aged 3, known to have had prodromal symptoms not to exceed 8 hours, had a pressure of 30, the highest recorded pressure of the series. Another case which developed symptoms within the hospital after an admission of 2 months for chronic eczema and was punctured within the first 24 hours had a pressure of 22. The child developed a Bell's Palsy four days later. In all the cases admitted with paralysis and having spinal puncture not longer than 3 days after onset of paralysis, the highest recorded pressure was 16. It is believed that increases of pressure are most marked early in cases of meningeal involvement and that the pressure shows a tendency to fall to a more nearly normal or normal level rapidly with the subsidence of acute symptoms (in contrast to the number of cells which tend to show an increase for some time).

The albumin and globulin are usually increased in the majority of cases, and this augmentation, when it occurs, tends to persist after the cell count has returned to normal.

Recent writers have emphasized the constancy of the Lange colloidal gold reaction in poliomyelitis. The spinal fluid in this disease produces a reduction in the colloidal gold solution in the tubes commonly called the luetic zone, giving a low luetic curve. It is said to be one of the most persistent of pathological findings in the fluid, for it remains elevated in a majority of the cases beyond the fourth week of the disease. It is unfortunate that because of the difficulty so frequently encountered in obtaining or keeping stable and dependable colloidal gold solutions this test cannot be more universally employed, or that the element of time must be so great to receive reports from dependable laboratories.

To recapitulate: There are certain cases of poliomyelitis in which a fairly characteristic combination of signs and symptoms precedes the onset of paralysis. These are fever, headache, gastro-intestinal disturbances, with vomiting and constipation, muscular pains, stiffness of the neck and spine and changes in the reflexes. In the presence of an epidemic this combination will be more easily recognized than in ordinary practice. We are inclined to believe that a good diagnostician on the look-out for poliomyelitis will succeed in diagnosing a large proportion of these cases.

Assuming that we have made a diagnosis of poliomyelitis, or of probable poliomyelitis, what is to be our next procedure and what results can be expected?

It seems to us that the best treatment of poliomyelitis consists of spinal puncture to reduce pressure and get rid of toxic cerebro-spinal fluid and human convalescent serum intramuscularly.

It is obvious that our short series of cases is not an adequate basis for conclusions as to the value of convalescent serum. For this purpose we have interesting statistics from the Manitoba epidemic of poliomyelitis in 1928 and also from the Massachusetts epidemic in the same year.

In Manitoba, of 161 cases 74 received serum in the pre-paralytic stage of the disease, 54 received no serum, while 33 received serum too late to be of value, or after the onset of paralysis. Of 57 cases which received an average of 25 c.c. of serum intramuscularly in the pre-paralytic stage 93 per cent made a complete recovery. There were no deaths. Of 54 cases receiving no serum at all only 26 per cent made a complete recovery, 11 per cent died, and the remainder were paralyzed. Of those cases which received serum after the onset of paralysis 57 per cent became paralyzed before the fourth day. Only 22 per cent in this group made a complete recovery, 33 per cent died, and 45 per cent became paralyzed. It seems that the earlier the onset of paralysis the worse is the prognosis, and that after paralysis has occurred serum is of little value.

Reports from the Massachusetts epidemic in 1928 by Aycock and others showed that of the treated patients 5.7 per cent developed severe paralysis, as compared with 46 per cent of the untreated patients. One hundred and sixteen cases were reported. The outcome,

as measured by fatality rate, percentage of paraylsis and so on, was strikingly better in the cases treated by serum.

We are much in favor of the use of human convalescent serum. Whether this is to be administered intramuscularly or intraspinally seems to be a matter of opinion entirely. A supply of human convalescent serum is kept at Bell Memorial Hospital and at the Kansas City General Hospital. In case it is desired to prepare human convalescent serum it can be done without very much difficulty.

In the selection of subjects for bleeding, patients who have had acute anterior poliomyelitis, who have a residual paralysis, and who have been fever-free for a period of not less than three weeks are chosen by preference. Serum collected from convalescent patients on the twenty-first day after the temperature has become normal contains the maximum of immune bodies. Blood can be used, however, from patients who have had an attack of poliomyelitis a long time previously.

The blood is drawn in the morning before the patient has eaten. Blood is drawn into a large sterile bottle equipped with mouth suction apparatus such as is commonly used in collecting blood for transfusion by the citrate method. No sodium citrate is used, however, in this procedure. The blood is left at room temperature for one-half to one hour, then placed in the incubator at 37 degrees C. for one-half hour, after which it is put in the ice box over night. The following morning the serum is pipetted into large sterile centrifuge tubes and centrifuged for fifteen minutes. The serum is decanted to a sterile bottle, enough being saved out for a Wassermann test. The preservative is made by adding one part of tricresol to two parts of ether. 0.8 c.c. of this preservative mixture is added to 100 c.c. of serum. All cloudy serums thus obtained are rejected. The serums so prepared are cultured aerobically and anaerobically. Observations on the culture should be made as late as 72 hours before considering the serums culturally negative. The serum should be kept constantly in the ice box in 10 c.c. stoppered bottles. From 10 to 25 c.c. may be given at one dose.

While relatively few control tests have been made with normal human serums, some recent investigations tend to show that normal human serums possess considerable power to neutralize the virus of poliomyelitis. While this work has not been completed, still the results are such that if one is unable to obtain convalescent serum it would seem justifiable to try the effect of normal human serum on the sufferer from poliomyelitis. In treating a patient 50 c.c. of blood may be withdrawn from the normal individual selected as the donor, this blood citrated, and then the whole blood injected into the gluteal muscle.

The occurrence of extensive and severe paralysis which quickly clears up or improves rapidly in a few days' time suggests that at least a part of the acute manifestations of poliomyelitis may be due to the effect of edema and swelling. Accordingly there have been some attempts made to treat this by administration of hyper-tonic salt solutions intravenously with suggestive results. Although we have never tried this, it seems logical, and one would probably be justified in working along this line or using 50 per cent glucose solution for this purpose.

We would urge that in cases which show evidence of meningeal irritation, especially in the presence of an epidemic, free use be made of spinal puncture, if a diagnosis of poliomyelitis can be made with reasonable probability that it is correct. The most earnest attempts should be made to treat the patient by every means available to prevent the onset of paralysis. Our most important measures are lumbar puncture, administration of serum and measures to reduce edema and swelling. In this way the best results will be obtained and our tragedies reduced to the minimum.

———℞———

RELAXATIVES

The increase in wet sentiment should be a warning to bootleggers and hijackers. If they do not mend their ways, they will have their law taken away from them.—New Yorker.

Notes On Pyelitis

NELSE F. OCKERBLAD, M.D., F.A.C.S.
Department of Urology

In all probability the usual conception of pyelitis, namely, that it is an infection confined to the kidney pelvis, is quite incorrect. Because of the fact that adults or infants rarely ever die of pyelitis, the opportunities to examine a kidney pelvis which has been diagnosed in life as pyelitis are very few.

The diagnosis of pyelitis is commonly made from the clinical findings and manifestations, such as pus in the urine, pain over the kidney region and an elevation of temperature, sometimes accompanied by chills and vomiting. Given this picture in a child, almost any doctor will diagnose "pyelitis." In view of these and other difficulties which beset the diagnosis of pyelitis, it is not to be wondered at that the general practitioner and pediatrician feels that if a pyelitis case does not clear up within three or four weeks some further investigation must be made to determine the pathology present. It is quite likely that, without obstruction, an infection of the kidney pelvis alone will produce only one finding, and that pus in the urine. Add obstruction, from stone, stricture, tumor, or from whatever cause, and immediately there is added another train of symptoms, namely, elevation of temperature, chills, leucocytosis, pain and vomiting. From this picture one gets the idea that one is no longer dealing with a simple affair like a pyelitis, but the filtering mechanism of the kidney is involved and we have a pyelonephritis.

For this reason I am convinced that the ordinary concept of pyelitis is not tenable and that true pyelitis is a fleeting disease incapable of long remaining confined to the kidney pelvis alone. If obstruction takes place then it immediately becomes a pyelonephritis. I believe we ought to call the cases that clear up readily under medication mild pyelonephritis cases; those that persist and have all the systemic signs and findings as fever, chills, leucocytosis and vomiting, acute pyelonephritis; and the ones that persist over a long period, chronic pyelonephritis.

The present terminology of infections of the kidney is not at all clear. Mallory in his text "Principles of Pathologic Histology," covers pyelitis and pyelonephritis in the term infectious nephritis. Infectious nephritis is a very useful term and is truly based upon the pathological histology in these cases. It would seem then that the difference between pyelitis and pyelonephritis is a difference only in degree and in time. You are, of course, familiar with Cabot and Crabtree's theory of 20 years ago regarding kidney infections which is, briefly, that the colon-typhoid group attack the kidney pelvis first, having, so to speak, a predilection for the kidney pelvis, and that the coccus group likewise have an affinity for the cortex of the kidney. Their theory would seem to work out fairly well in practice and even now it has many adherents. Almost all cortical abscesses and perinephritic abscesses are of the coccus group it is true. It seems equally verified that the large majority of all infections of the kidney pelvis are of the colon-typhoid group, because of the fact that whenever cultures are made from separate urines and sent to the laboratory the routine report reads "colon bacilli found." However, this may be by using such culture media as suggested by Rosenow, Haden and others, namely, glucose-brain-broth which provides various grades of oxygen tension a surprisingly large number of these so-called colon bacilli pyelitis cases resolve themselves into infections by the well known streptococci.

From this it can be readily understood why some of us believe that the colon bacillus is not always the primary infecting organism but it is often the camp follower, so to speak. If this is true then we may account for the severity of the storm raised by such a disease as a so-called "colon pyelitis." It probably was not a colon bacillus infection that wrought the havoc, but that germ with the bad reputation, the streptococcus. I do not believe that there has yet been done enough painstaking work on bacteriology of pyelitis and pyelonephritis

to determine beyond peradventure just what the infecting organism is in every case or even what are the 3 or 4 commonest infecting organisms.

As to the etiological factors, because of the frequency with which colon bacilli have been cultured from so-called pyelitis cases the intestinal tract has been considered the largest and most obvious source and, therefore, the most likely focus possible.

Hunner is of the opinion that focal infections in teeth and tonsils produce metastatic lesions in the ureteral wall, which result in ureteral stricture, producing a stasis of urine behind it and thus furnishing the conditions for a kidney infection, pyelitis, pyelonephritis or pyonephrosis. I am quite sure there are cases in which both of these etiological factors operate to produce kidney infections. I am, however, firmly convinced that a not inconsiderable number of pyelitis and pyelonephritis cases have their origin in infections of the respiratory tract. There are more and better reasons for this idea than for the theory that they have their origin in gastro-intestinal infections alone.

If my contention is true, that the colon bacillus is not the primary organism but merely a camp follower upon the heels of the streptococcus, then the case for the respiratory tract becomes stronger. The bacteriology of influenza is still unknown, but it is suspected that a streptococcus may be the real basic cause for most severe respiratory infections. These respiratory infections may be mild, as in the common cold, or severe and serious as in the so-called influenza or in pneumonia. In any event it cannot be denied that even in the milder cases we have a blood stream infection. In the more severe cases of respiratory tract infection the blood stream infection is more prolonged and the infecting organism is more virulent.

The general public has curious ideas as to how to treat a cold, or what we term a respiratory tract infection. More than half of the persons thus afflicted will proceed as follows: (1) Take some drastic purgative, (2) load up on some hot fluid like hot lemonade or some hot toddy, if obtainable, (3) take a hot bath and (4) go to bed. The only rational part of this proceedure is the "go to bed" part. Everything else is calculated to disseminate the bacteria and their toxin to every part of the body in the shortest possible time. It not infrequently happens that two or three weeks later, when this cold has passed away, the patient having almost forgotten the incident, comes down with another fever, sometimes ushered in by a chill and severe prostration and accompanied by pus in the urine. This is an acute pyelonephritis, beyond the shadow of a doubt the result of the respiratory tract infection. So I feel rather strongly that the respiratory tract is responsible for more kidney infections than the intestinal tract.

In thus stressing the respiratory tract, I am not overlooking the importance of the focal infections in tonsils, teeth, sinuses or in the skin. The role that such infections play is so well known that it needs no further reiteration.

The diagnosis of pyelitis or pyelonephritis is not always easy. It may be quite true that a patient may have the pyelitis symptoms and findings and clear up readily under simple rest in bed, ample fluids and suitable medication. On the other hand, a patient with identical symptoms will not respond at all to such therapeutic measures. A complete urological examination is then necessary to determine the cause of the continued pus in the urine.

In the treatment of this disease it is necessary to clear up all focal infections and put the patient in the best possible physical condition. One must not overlook the fact that obstruction of the ureter, either partial or complete, because adequate drainage of the kidney is prevented may be an important factor. Before the time that physicians made routine microscopic examinations of the urine many of these cases passed for typhoid fever or malaria or pneumonia, if there happened to be a few rales in the chest. Undoubtedly some of these pyelonephritis cases run a course and clear up, though I believe this to be the exception rather than the rule.

Certain cases appear to have a residual focus within the kidney itself or beneath the capsule which at intervals lights up and produces a periodicity which is very puzzling and difficult to combat by ordinary means. It is very important to know that every case of pus in the urine is not pyelitis. Even in children it is not safe to make a diagnosis of pyelitis because of pus in the urine. As a tentative diagnosis it may be well enough, but if the pus persists longer than three weeks, when ordinary remedies have been applied, then it is time for a complete urological examination to determine the cause of the persistent pus in the urine.

You are, of course, familiar with the classic descriptions of the routes of invasion in kidney infections, namely, through the blood stream, by the lymph and the ascending route.

From the foregoing you may be impressed with the idea that I have stressed the blood stream method of infection and perhaps so I have. The direct, or ascending route is also a factor and the work of Gruber has recently given us some reason and ground by the experimental evidence he has presented.

As early as 1902 Forssner showed experimentally that when streptococci are grown in kidney extracts they have a special predilection for the kidney when injected intravenously.

In 1911 LeFur introduced different organisms into the bladders of animals for the purpose of producing ulcers. He observed that although streptococci, staphylococci and other organisms were originally injected into this viscus, the *B. Coli* was the only one subsequently recovered in the urine. He emphasized the fact that the *B. Coli,* which is so commonly found, and believed to be the cause of infection, is a secondary invader of mere importance as a natural inhabitant of the urinary tract. This apparently overlooked bit of experimental work of 20 years ago tends to prove what we have learned from clinical experience.

In conclusion we may lay down the following principles gleaned from the clinical study of many hundreds of the so-called pyelitis cases.

1. That in all probability there is no such thing as a pure pyelitis for even though the disease may begin as such it quickly invades the kidney and becomes a pyelonephritis or infectious nephritis.
2. The bacteriology of the disease is not settled; the streptococci may be at the bottom of more of these cases than we now believe.
3. Respiratory tract infections play an important role in pyelonephritic cases.
4. There may be a residual focus within the kidney cortex or beneath the capsule which lights up and produces a puzzling periodicity.
5. All persistent pus-in-the-urine cases must be investigated thoroughly to determine the site of the trouble and if possible the cause.

———R———

Dermoid Cyst of Ovary Combined With Large Pseudomucinous Cyst

RALPH R. WILSON, M.D.
T. J. SIMS, M.D.
Department of Obstetrics and Gynecology

Pseudomucinous cysts of the ovary constitute a large part of gynecology. To Ephraim McDowell goes the credit for successfully instituting surgery in the treatment of this condition, and so much progress has been made in the last quarter century that rarely are ovarian cysts allowed to reach spectacular proportions before being removed. The chief complaint in the majority of these cases originates from pressure.

Dermoid cysts of the ovary are encountered much less frequently, and rarely does the host seek relief from pressure symptoms. The complaints usually originate from adhesions to surrounding organs or as a result of spontaneous rupture of the cyst wall.

The combination of the two types of cyst in the same ovary, according to both Graves and Crossen, is "not infrequent" and usually the dermoid is found incorporated within one of the multilocular chambers of the main cyst sac.

The following case is considered of interest because of:

1. The unusual proportions of the cyst.

2. The combination of dermoid cyst and pseudomucinous cyst in the same ovary.

3. Points of management necessary in the successful removal of large abdominal tumors.

CASE REPORT

This patient, a married colored woman of thirty-nine, was first seen May 14, 1930, seeking relief from edema of the lower extremities and shortness of breath. Her past history was essentially negative both by name and symptoms. The menstrual history is not remarkable, menstruation starting at thirteen, of usual regularity and duration. She has four children living and well. There had been no other pregnancies.

Her only illness began about four years ago, soon after the birth of her last child, when she first noted an increase in the menstrual interval and a decrease in the actual amount of flow. This continued, with little other disturbances, until about five months ago, when her abdomen began to enlarge rapidly. Since it was associated with nausea and vomiting, she considered herself pregnant, although no other associated symptoms of early pregnancy were present. About six weeks ago she began to have edema of the lower extremities. Soon thereafter she became short of breath and began to have sharp pains across her lower abdomen, particularly following exertion. Curiously enough, she insisted that she began to feel fetal movement about two months ago, which continued for a period of about six weeks, but none had been perceptible for the last few weeks.

At her first examination definite diagnosis was not made, feeling that it was some question whether this was a pregnancy complicated with hydramnios, or an ovarian cyst. She was seen at subsequent and short intervals until she was finally operated August 1, 1930. She had been encouraged to be operated at her first admission and on subsequent visits, but had persistently refused until she was entirely disabled by a huge abdominal tumor which had stretched the skin to glistening tightness, had flared out the costal margins of the thorax, had caused incontinence of urine, had produced enormous edema of the lower extremities up to the groins, had made it impossible to lie down flat, and had grown to such size that she could scarcely turn her body in bed.

OPERATION, DESCRIPTION AND COMMENT

Preliminary medication consisted of morphine and scopolamine. The abdomen was opened under local anesthesia of ½ per cent novocaine. The incision was made to excise an elliptical area, including the umbilicus and extending from about three inches below the xyphoid to one inch above the symphysis pubis, this being done in order to take up the slack from over-distention. One of the multilocular cysts was opened accidentally but fortunately the content of the chamber was of jelly-like consistency and its escape could be controlled with little difficulty, allowing the abdomen to be emptied gradually, consuming a period of about forty minutes. It was necessary to administer gas oxygen anesthesia for abdominal exploration and

Figure No. 1
Picture Taken Before Operation

the table was placed in Trendelenberg position to avoid shock which might follow the release of intra-abdominal pressure. Upon attempting to remove the cyst, its wall was found plastered by pressure to both the visceral and parietal peritoneum wherever it made contact throughout the abdominal cavity. It was peeled off with little difficulty, leaving no bleeding surfaces, as it seemed to be merely agglutinated rather than actually adherent. Once mobilized, the cyst was

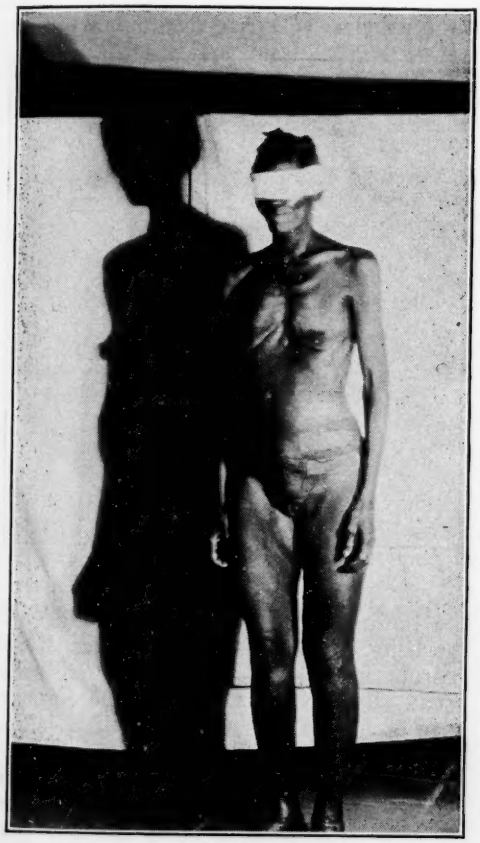


Figure No. 2
Picture Taken After Operation

found to be connected by a broad pedicle to the right broad ligament and embraced the whole right ovary. All other pelvic organs were normal. The stump was ligated and the cyst removed in the usual manner. Unfortunately, a considerable amount of the pseudomucinous contents had been spilled into the peritoneal cavity before the removal was completed, but this was assiduously sponged out at once. The abdomen was closed in layers without drainage. A large pillow was then strapped tightly over the abdominal dressing and she was given, prophylactically, 600 c.c. of citrated blood before leaving the operating table. At no time during the operation did she show evidence of shock.

PROGRESS NOTES

Her daily progress was essentially satisfactory throughout. The abdominal pressure being loosened gradually from day to day until finally the pillow was removed from the dressing and the elevated bed returned to a flat position. No doubt her enormous edema supplied body fluids that otherwise would have had to be administered. On the fifth postoperative day, she was given 500 c.c. of 10 per cent glucose, which produced a chill but thereafter she continued to make rapid progress. On the twelfth day the skin clips were removed, as the incision had healed by primary union. She was dismissed, after being up and around the ward, on the fifteenth postoperative day.

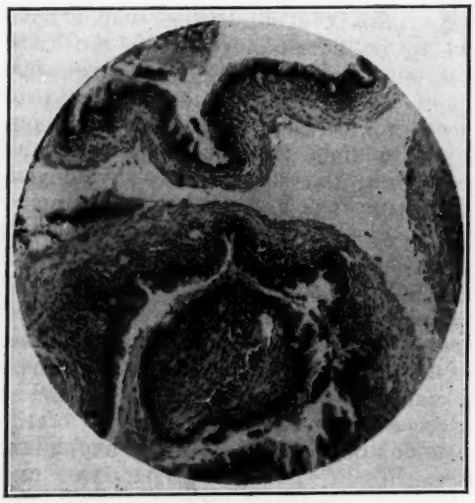
Several interesting features presented themselves in the postoperative course. First, upon recovering from the anesthesia, she was unable to adjust her respiratory rhythm. The removal of the obstacle of increased intra-abdominal pressure contributed to hyperpnoea and a feeling that respiration would not continue automatically. By the third day this discomfort had entirely passed. As a result of elevating the foot of the bed for the tremendous leg edema, a pulmonary edema was produced but fortunately was recognized early. Ileus and general peritonitis, the conditions most feared in view of the extensive visceral manipulation, were conspicuous by their absence. Also, the bladder, which had been incontinent for weeks from pressure, began to function at once, although caution was used lest it become over-distended. When the ambulatory stage was reached, the patient was compelled to readjust her equilibrium, as she had a tendency to fall backward. Her sense of

balance had been disturbed by removing the weight of the tumor.

The accompanying photographs show the patient before and after operation.

GROSS PATHOLOGY

Large tumor mass measures 65 by 45 by 9 cm. which is made up of numerous large and small locules with a fairly smooth surface, to which are attached fibrous adhesive tags in several areas on the postero-lateral aspect. The pedicle, measuring 8 cm. broad and ½ cm. in thickness and 3 cm. in length, is quite vascular, containing several large blood vessels. On section, the cyst is found to be mutilocular with locules varying from 1 to 24 cm. in diameter and with walls measuring from 1 to 5 cm. in thickness.



Micro-Photo No. 1

In some of the larger locules the walls are transulcent and the color of the content is readily seen, while in others the walls are thick and opaque. The contents of these locules, for the most part, are pseudomucin but in some locules a more watery and hemorrhagic content is noted. The material, measuring 17,000 c.c. has a specific gravity of 1.040. It is estimated that an additional 3,000 c.c. of the material was lost at operation.

Incorporated in the above tumor mass, adjacent to the pedicle, is a very different mass which is hard, thick walled and of a yellow color. It is spherical and measures 6 cm. in diameter and on section contains sebaceous material and hair. In one wall is a projecting area of skin with a small spicule of underlying bone. A tuft of hair springs from this skin area.

HISTOLOGICAL PATHOLOGY

Section through the cyst proper shows cyst cavities lined by tall columnar cells with basal nuclei. In some areas papillary projections are seen extending into the lumen but the cells remain in a single layer with an orderly arrangement of the basement membrane. In some areas the epithelial cells are desquamated into

Micro-Photo No. 2

the lumina. The stroma is cellular and the cells are large and vesicular. Blood vessels are fairly numerous. In some areas the stroma takes on the appearance of ovarian tissue. (See Micro-photo No. 1.)

The section through the dermoid has a typical appearance. The cavity is lined by stratified squamous epithelium containing hair follicles and numerous sebaceous glands. The stroma is quite typical. (See Micro-photo No. 2).

PSEUDOMUCINOUS CYST

Characteristics	91 cases (Graves)	Our case
Age of incidence	46.1% between 40-55 years	39 years
Known sterility	17.9%	4 children
Abnormal menstruation	41.7%	Irregularity
Symptoms due to tumor direct	76.9%	Multiple

Occurence of malignancy	17.5%	None
Bilateral occurence	3.2%	None
Tumor adherent (easily separated)	43.9%	Extensively
Opposite ovary entirely normal	90.1%	Yes

DERMOID CYST

Characteristics	77 cases (Graves)	Our case
Age of incidence	63.6% between 20-40 years	39 years
Known sterility	10.1%	4 children
Symptoms directly due to tumor	54.5%	None
Average duration symtoms	3.72 yrs.	None
Malignancy	None	None
Associated with ovarian cyst	10.4%	Yes
Menstrual complaints	None in 57.8%	Yes, irregularity
Results	Uniformly good	Good

We wish to express our appreciation to Dr. L. A. Calkins, Chief, Department of Obstetrics and Gynecology, for permission to manage and report this case.

Myxedema—Difficulties of Diagnosis—Difficulties of Treatment

LOGAN CLENDENING, M.D.

Professor of Clinical Medicine, University of Kansas

You probably will react with a distinct feeling of ennui when you find that this lecture is to be conducted on the worn subject of myxedema. For most of you, the information about this disease is well crystallized; you regard the diagnosis as more or less self-evident and the treatment as entirely sterotyped and specific.

But my reason for presenting a case of this disease is to emphasize two points. First, the difficulties of diagnosis and, second, the difficulties of treatment. Nor is my thesis the time worn one of the *formes frustes* of myxedema, the incipient or incomplete myxedemas, the abortive forms. The most frequently missed cases are those in full flower, completely developed, frank cases. Nor are these missed diagnoses made by incompetent men. As I shall show you they are made by professed specialists in diagnosis, and the most careful and painstaking diagnostic clinics.

This patient, a woman, is 46 years old. She has a daughter and a young granddaughter; her husband is living and well. She has been in the climacteric for three years, and still menstruates irregularly and scantily.

The history of the case is very vague. This is a regular feature of such cases and an important cause why the diagnosis is not made. These patients talk slowly and think slowly and cannot give a clear short history. Most physicians nowadays do not have the time to listen out a myxedema patient's story.

The relatives of this patient have not been interviewed. It is usually from them that the best history is obtained.

Face of Patient With Myxedema

The principal complaint is fatigue. A peculiar kind of fatigue. A fatigue of utter listlessness. She has lost some hair around the forehead and has acquired a peculiar brownish-yellowish tinge to the skin. She has not gained any weight, and is, you see, fairly emaciated. She is frequently nauseated, and mentally depressed.

Physical examination should make the diagnosis but we are deflected on the

A clinical lecture delivered at Bell Memorial Hospital before the Southwest Clinical Conference, October, 1930.

threshold of examination by the finding first of albumin and casts in the urine, second of a low red blood cell count, and the report of pernicious anemia from a clinical pathologist.

It is indeed unfortunate that the diagnosis was given away in the title because it would have been possible, I believe, to present the findings as those of nephritis or of pernicious anemia and to persuade you of the validity of those diagnoses.

The pigmentation, the changes in the skin, the infiltration of the skin, is suggestive of any of them and leads to error unless myxedema is constantly remembered as a possibility in middle-aged people, especially women.

The classical sign of increase in weight is not present in this patient and there is only a slight amount of myxedematous infiltration in the skin.

The quality of the hair is a matter I do not feel so confident about since a cynical interne cut off some hairs from normal and myxedematous patients and also cretins put them on individual sheets of paper and asked a group of staff members to identify the coarse hair of the hypothyroid patients. The attempt was not conspicuously successful.

The basal metabolism has been persistently minus thirty or below, a most reliable diagnostic sign. A metabolic rate of minus ten or minus twenty is of no great significance but more than that is certainly diagnostic.

Fahr has drawn attention to a myxedema heart. It is characterized by enlargement of all four chambers, slow pulse rate, a normal blood pressure and electrocardiographic changes. This patient has a large heart, a pulse of 70, and some notching of the QRS wave. I do not see that the cardiac changes of myxedema are very specific. The patients are middle-aged and arteriosclerotic usually and we would expect some such changes.

Chaney, of the Mayo Clinic, has studied the tendon reflexes in the disease. "In myxedema" he says, "the tendon reflexes produce such slow movement of the parts that the quality can be recognized without the aid of mechanical devices and is a valuable sign in diagnosis." This is natural in view of the general sluggishness of the nervous system in myxedema. The reflexes in this patient, however, are rapid.

Looking over the whole clinical picture—getting a general view of the entire patient—we see that there is not only a deficiency in the secretion of the thyroid gland causing changes in the general metabolism, the nervous system, and the skin and its appendages, but also a general vascular change, with renal degeneration and a secondary anemia of high grade. These widespread changes must be grasped in order to understand the pathologic physiology of the disease, and also the mistakes which arise in diagnosis.

The frequency with which myxedema is overlooked may be illustrated by two pieces of concrete evidence which speak for themselves. They should be examined in an attitude of prayerful meditation.

Dr. C. C. Sturgis, Professor of Medicine at the University of Michigan, told me that he went last summer to visit his home town in Oregon. He entered the general store in the village and the proprietor, an old friend, came forward to greet him. One glance at him was sufficient to establish the diagnosis of myxedema.

"You've been sick, haven't you?" Dr. Sturgis asked the proprietor after the preliminary greetings were over.

"Yes, I have," the man agreed, speaking very slowly, "and nobody seems to know what's the matter of me."

"What kind of treatment have you had?"

"Well, I went to a diagnostic clinic in the city and they had a surgeon take my gallbladder out, but it don't seem to have done me any good," and then he went on at a deliberate pace to recount his troubles.

"I believe I can help you," said the doctor.

"I believe you can, too—because you're the first doctor that's had time to listen while I said everything that's on my mind."

The second piece of evidence is a letter from a patient with myxedema sent to a doctor and printed some years ago in the Archives of Internal Medicine.

"I must apologize for not writing for so long, but my time is taken up, it seems to me, and I hardly know how I spend my time. It has been a year now since I left the office and began doctoring and I do not see that I am one bit better. Have been to two specialists for my nose, throat and palate. They both said the palate and vocal cords were partially paralyzed. My tongue is also much swollen, which hinders my talking to some extent. They sent me to a specialist on the eyes, and he sent his report to Dr. ———. They had me examined by some kind of a specialist who examined, I believe, every nerve and organ in the body. He reported to Dr. ——— while I was there, and I heard a good deal. He thought it was Bright's disease. But Dr. ——— thought not as he had been keeping his examinations up so carefully. Then the other doctor said it was a tumor at the base of the brain, and wondered I had never had the headache or convulsions, or had never been unconscious. I am still a bad color, I still swell sometimes; my breath is dreadful. Have a rash over my body which looks like warts. I feel all right while in the house, but when I go out I feel very tired, especially walking up hill. I am still getting stouter."

Treatment is also a matter of more difficulty in myxedema than one would be led to expect. The condition is due to atrophy of the thyroid and deficiency of its secretion and, therefore, all one has to do is give the patient thyroid extract. So thinks the blithe novice in practice. But when one actually begins to give thyroid extract the patients frequently experience different kinds of accidents which are unpleasant and even actually terrifying.

The commonest of these are attacks of angina. One patient said she could get along pretty well if she walked slowly until she began taking the medicine, and then she had such pain in the heart she could hardly go more than a few steps. In fact, so annoying was this that she left off taking the drug entirely. The explanation is clear when one remembers the crippled circulatory system and the anemia. Thyroid extract is a powerful cardiac and vascular stimulant and cannot be forced indiscriminately on a weakened circulatory apparatus. The anemia also plays a part. The impoverished blood does not bring enough oxygen to a myocardium whipped up to a pitch of extra endeavor. The treatment, therefore, does not consist in simply exhibiting a specific remedy to a patient in sufficient quantities to restore the patient to normal. The whole patient—anemia, heart, nervous and digestive systems—must be considered and treated.

The form of thyroid medication to use is the whole extract of the gland. Differences in opinion as to the structure of the thyroxin molecule are represented in the divergent formulae of Kendall in America and Harrington in England. Thyroid secretion is probably more complicated than we suppose and until further knowledge is at hand the whole gland substance should be used. The procedure is wisely divided into (1) the initial dosage and (2) the maintenance dosage—two separate stages in therapeutic application. Neither can be determined except by trial on each individual patient. The average initial dosage—that is, the amount that is required to raise the metabolic rate to normal, and make the patient subjectively comfortable, with a feeling of warmth and a loss of weight—is from 2.3 grm. to 6.5 grm. The maintenance dosage has been found to be from .13 grm. (2 grain) a day to .195 grm. (3 grains) a day.

REFERENCES

1. Anders—Diagnosis of Myxedema. Am. Jour. Med. Sci., Dec. 1920.
2. Chaney—Tendon Reflexes in Myxedema. J.A.M.A., Vol. 82, No. 25. June 21, 1924.
3. Fahr—Myxedema heart. J.A.M.A., Vol. 84, No. 5. Jan. 31, 1925.
4. Sturgis & Whiting—The Treatment and Prognosis in Myxedema. J.A.M.A., Vol. 86, No. 25. Dec. 26, 1925.

—B—

Mr. Warburg, New York banker, says business revival needs the help of psychologists and not economists. Perhaps a few buyologists would help.—Brunswick Pilot.

✣ ✣ ✣

According to a psychologist, people are most intelligent at the age of fourteen. Before they go to college.—Louisville Times.

Fractures of the Femur

C. B. Francisco, M.D.
Department of Orthopedics

The Workmen's Compensation Laws which exist now in practically every state are having their effect on the treatment of fractures. This influence is, in my opinion, going to be beneficial. Better and quicker results are being demanded by the insurance carriers and every industrial case that sustains a fracture of any magnitude is going to be reviewed by the Workman's Commission and incidentally will often be passed upon by other physicians. This procedure has certainly been a stimulus to all doctors to attempt to do better work. No one is desirous of having bad results publicly displayed and everyone therefore strives to produce as commendable exhibit as possible. However, end results are often misleading without due consideration of the circumstance that existed during the time of treatment, and the physician is not always able to control these circumstances, therefore, we should be careful and not be hasty in our criticism of results of our brother practitioners. It has been my observation that as a rule doctors are too much inclined to cast reflections about the character of some other doctor's work and no doubt the germ of a malpractice suit is often sprouted by such remarks.

If we are to meet the demand that is being made for better results and less time off duty in the treatment of femur fractures we will be required to improve our methods somewhat. This means that we must take advantage of every opportunity that will hasten the union of a fracture. Early reduction, control of infection and as accurate alignment as possible are all factors that determine the outcome. All fractures should be reduced as soon as possible. Of course the life of the patient comes first but when the shock is controlled attention to his fracture comes next. In this discussion fractures of the neck of the femur will not be considered.

In compound fractures efforts should be made to clean up the wound so that infection will not occur rather than waiting to see if the wound is infected. If every compound fracture, where the wound is of any size, is carefully and continuously scrubbed for twenty minutes with tincture of green soap and water and then debrided within eight hours after injury there will be very few infected fractures. It is true the small punctured wounds made by fragments of the bone piercing the skin can be ignored in most cases, but the big open wounds can not. The recent compound fractures that are not seen until infection has begun can be sterilized by the application of moist alcohol packs, applied continuously with some pressure under an oiled silk dressing. I think that Dr. L. E. Evens, who is with the Aetna Life Insurance Company, has demonstrated that an alcohol dressing that is kept continuously moist by means of injecting alcohol with a medicine dropper through holes in an oil silk covering will clear up infection in any of the soft tissues in forty-eight to sixty hours.

After the wound in compound fractures has been cleansed, extension should be applied and the greater the damage to the soft parts the greater the need for extension and splinting. The Thomas or Hodgens splint can be used in these cases but I think the new Boehler's splint makes it easier to secure adequate extension. I never saw a case of a fractured femur that was harmed by too much extension. In maintaining apposition in compound femur fractures no foreign material should ever be used, in my opinion, except possibly a drill or metal pin for a few days, until the extension gets control of the muscle spasm. The keynote therefore in compound femur fractures is sterilization of the wound and adequate extension.

The management of fractures of the femur depends on the location of the fracture and the time that has elapsed since the fracture occurred. In the upper third, not including the neck, recent or old simple fractures should be wired and then have some kind of fixed extension with a plaster cast. If you don't wire them or put on some other form of internal fixation you will have difficulty

maintaining apposition and if you don't use extension you will have outward bowing that is often markedly disabling. This is true for both adults and children.

Recent fractures in the middle of the shaft of the femur can easily be held with simple wiring and the application of a plaster cast without extension. Fractures that have gone unreduced for ten days or two weeks should be wired and have fixed extension. If the inelasticity of the infiltrated muscle is allowed to pull against the ends of the bones delayed union is likely to occur and may result in nonunion. Fixed extension can be secured by incorporating the ends of the adhesive plaster in the cast by turning them back over the plaster and applying another plaster bandage or by a rustless steel nail or Steinman pin placed through the bone and incorporated in the plaster cast. Fractures of the lower third of the femur that are displaced require skeletal traction. The Pierson ice tongs placed just above the condyles with the traction made over a new Boehler's splint is probably the best method of maintaining reduction and preventing the distal fragment from dislocating posteriorly. Fractures in this area that have gone unreduced for a week or more often require open operation to secure apposition but rarely require any form of internal fixation when skeletal traction is used.

Fractures of the femur in children under five years of age rarely if ever require any form of internal fixation. Good anatomical and functional results can be secured by overhead (Bryant's) extension with manipulation. It should be remembered that not even contact is required to secure union and good results in children. Above five years of age much the same management should be used in children as has been outlined for adults.

It will be observed that I have not mentioned bone grafts or intramendullary pegs and in my opinion they should be reserved for the treatment of nonunions and are not satisfactory agents for maintaining apposition in fresh fractures. They often break just at the time when stabilization is required, namely, when joint motion is started and allow marked bowing in spite of splinting.

Lane plates have a usefulness and are not to be condemned, however, the application of wire is much simpler and more easily done than applying a Lane plate. Through a small incision the fracture is exposed and a hole drilled through the cortex of either fractured end and the wire passed through, the fracture reduced and the wire tightened only moderately tight, so that a degree of motion is permitted which will prevent the wire breaking. The wire should not encircle the bone and should only go through one cortex. Callus forms much more rapidly than when a Lane plate is used. The cast is removed at the knee in five weeks and motion started and the patient allowed up on crutches in six weeks, into a Caliper brace in eight weeks and back to light duty in twelve weeks.

In conclusion I would like to make a plea for the management of fractured femurs along the lines mentioned. To try out all suggested plans is a waste of time and effort. Few of us are permitted to have an opportunity to try the different methods and find out for ourselves their short comings and if we can accept a plan that has been tried and proven workable and on the whole superior to other methods a plea for its adoption should be worthy of consideration.

Water and Salt In Surgery

THOMAS G. ORR, M.D.

Department of Surgery, University of Kansas School of Medicine

It is quite self evident that the tissues of the human body cannot properly function if there is a deficiency in the essential elements that make up its elaborate chemical properties. No one pretends to know all of the many chemical reactions that take place in the body laboratory. Some of the essential elements of the body are quite well known, and their proper adjustment has a definite bearing upon our routine therapy in many diseases. I believe that it may be accepted as a true statement that there is no therapy so logical as that which has to

do with the substitution in he body of elements that are lost by or during the course of disease.

In health, water exists in the body in balanced quantity and is quite constant. This normal balance of the water in the body existing in health should suggest the thought of re-establishing such a condition in disease. Water is capable of absorbing large quantities of heat, thus preventing high temperature rises in the cells. Water, because of its fluid nature, is capable of distributing the heat equally throughout the body and carrying the excess to the surface where it is given off. Water then acts as a buffer in high temperature changes and as a vehicle of heat within the animal body. A certain quantity of water must be present in order that chemical reactions may take place. Blood becomes concentrated in fever and there is thirst. Water may be held in tissues in some unknown way, and heat regulating mechanism disturbed. It is notable that there is often a remarkable flow of water from the kidneys following crises of pneumonia, as if water had been bound in the tissues.[1] It may be said in fevers that there is a deficit of the so-called "free" water as opposed to the bound water.

In recent years the importance of sodium chloride in the normal functioning of the body has been emphasized. A number of years ago it was discovered that there was a decrease in chlorides in the blood and urine of pneumonia patients. Just what becomes of the chlorides has never been satisfactorily explained. The rapid return to normal of the chlorides as the patient convalesces from pneumonia indicates that they are retained in the body. Why this apparent shift in chlorides occurs is not known, but it is at least suggestive that they may be part of the body protective mechanism in a serious disease.

In health, the chlorides maintain quite an even balance in the body. Sodium chloride is necessary for life. Changes in this salt are usually somewhat parallel to the change in the water content of the body. In fact, the two are so closely associated that they should be considered together.

The interesting work of Underhill[2] and his associates on the changes of the blood in extensive superficial burns is very illuminating. They have found that the blood becomes highly concentrated. the hemoglobin percentage reaching as high as 200 in some cases. In spite of this concentration of the blood the chlorides are reduced as noted by Davidson.[3] It is here then quite logical to assume that the supply of water and salt may be beneficial in the treatment of burns. Such is surely the case as demonstrated by both of these authors. Underhill notes that the forcing of fluids in burns relieves delirium unconsciousness, gastro-intestinal disturbances, albuminuria and hemoglobinuria. A decrease in the blood concentration is of prime importance in the treatment of burns. In acute intestinal obstruction the restoration and maintenance of water and sodium chloride balance is fundamental. In this disease, both may be lost in large quantities. Coincident with this loss there is a change in the constituents of the blood which indicates the extent and gravity of the disease. There is an increase in the non-protein nitrogen, and in the high obstructions an increase in the carbon dioxide combining power. The administration of salt solution will tend to reduce these changes to normal. No other known solution has this tendency. Glucose solution or distilled water have no effect upon the progress of intestinal obstruction as far as restoration of water and chemical balance is concerned. It is then seen in this disease that both water and salt are essential to produce internal body equilibrium. Acute intestinal obstruction illustrates in an extreme degree the importance of supplying water and sodium chloride in the body. This being true, it is reasonable to believe that a normal balance of water and salt should be maintained in such conditions as pyloric obstruction, peritonitis, paralytic ileus, toxic states with vomiting, and pre and post operative states when water by necessity has been restricted. In this class of cases it is of extreme importance that the necessity of water and salt balance be appreciated, since by the prompt supply of an ade-

quate quantity of these essentials much of our postoperative worry and distress of our patients may be averted.

In the supply of water and salt more than a hazy notion of the necessity of such treatment is imperative. It is not sufficient to say that patients should have salt solution, but each patient's need must be carefully analyzed and an adequate supply furnished. This is where judgment and careful laboratory work play their roles. Judgment tells you the needs of a patient from the clinical standpoint and suggests when to resort to the laboratory for support. A little experience will tell you that a patient is depleted of water. If water is not being taken by mouth in normal quantities in ill patients, attention should be given at once to the parenteral administration of water as sodium chloride or glucose solution.

Rowntree[4] made the interesting observation that dogs could be intoxicated by giving them large quantities of water. This condition is hardly to be anticipated in the treatment of patients. Such symptoms could not be produced by physiologic salt solution. The symptoms of water intoxication can be relieved by the administration of hypertonic salt solution. Distilled water is not advised to restore water balance in disease.

The untoward reactions to excessive quantities of salt solution are edema, albuminuria and possibly embolism and thrombosis. It is also quite probable that the circulatory system may suffer in certain cases of myocardial weakness if excessive quantities of liquid are given rapidly by the intravenous method.

Experimental dehydration results in increased viscosity, increased N.P.N. and urea nitrogen, increased chlorides, increased total protein and increased fibrinogen in the blood. The significance of such changes in any degree in clinical patients should be evident from these findings. It must be assumed that the body functions are greatly disturbed by such diviations from the normal. Keith[5] mentions dehydration as an important factor in Asiatic cholera, dysentery, acute anhydremia of infants, upper intestinal obstructions, pyloric obstruction, pernicious vomiting of pregnancy, obstructive jaundice with vomiting, uremia and diabetic coma.

Hartwell and Houget[6] first noted that lives of animals with intestinal obstruction could be prolonged by giving salt solution. They gave the credit to water and overlooked the importance of salt.

It is not the intention to discuss here the acid-base balance of the body, but it seems important to mention in this connection the findings of Edmund Andrews.[7] He noted that the quantity of water, possible to cause a dog to excrete, by intravenous injection of hypertonic glucose or salt solution is directly proportional to the alkalinity of the blood. The greater the alkalinity of the blood the greater excretion of water produced by hypertonic solutions. This observation should be carefully noted by clinicians to determine if it has any true value in treatment.

According to McLean[8] "it is a truism that equilibrium in the physico-chemical sense, occurs in the organism only in death. The condition of balance between varying, shifting and opposing forces, which is characteristic of living processes in general, is variously spoken of as a "dynamic equilibrium," a "correlated state" or a "steady state." The condition of edema has to do with water balance of the body. The fundamental problem is that of the physiologic regulation of the volume of the internal environment, including the blood and tissue fluids. Edema is not an entity but a symptom just as dyspnoea, and results as a disturbance of the regulating processes.

CONCLUSIONS

In the treatment of dehydration, especially when associated with vomiting, glucose solution should not be depended upon as a sufficient treatment. Sodium chloride is a necessity in the maintenance of water balance.

Tap water or distilled water should only be given by mouth or rectum in the treatment of dehydration.

Too much sodium chloride may be given and edema produced. Chemical studies of the blood are of value in estimating the quantity that should be used.

LITERATURE

1. Balcar, J. O., Sansum, W. D. and Woodyatt, R. T., Fever and the Water Reserve of the Body, Arch. Int. Med., 24:116, July, 1909.
2. Underhill, F. P., Carrington, G. L., Kapsinow, R., and Pack, G. T. Blood Concentration Changes in Extensive Superficial Burns, and Their Significance for Systemic Treatment, Arch. Int. Med., 32:31, July, 1923.
3. Davidson, E. C., Sodium Chloride Metabolism in Cutaneous Burns and Its Possible Significance for a Rational Therapy, Arch. Surg., 13:263, Aug., 1926.
4. Rowntree, L. G., Water Balance in the Body, Physiological Review, 2:116, 1922.
5. Keith, N., Intravenous Medication: Physiologic Principle and Therapeutic Applications, J.A.M.A., 93:1517, Nov. 16, 1929.
6. Hartwell, J. A. and Hoguet, J. P., Experimental Intestinal Obstruction in Dogs with Especial Reference to the Cause of Death and the Treatment by Large Amounts of Normal Saline Solution, J.A.M.A., 59:82, July 13, 1912.
7. Andrews, Edmund, Water Metabolism, Arch. Int. Med., 37:82, Jan., 1926.
8. McLean, F. C., Edema as a Problem in Physiological Regulation, Physiological Reviews, 5:618, 1925.

The Hemoglobin Standard

C. F. Nelson, M.D.

Department of Biochemistry

The other day we measured, with great care, the hemoglobin content of my own blood. At eight o'clock in the morning I was anemic, at noon almost normal, by six o'clock in the evening the hemoglobin content of my blood was a full 100 per cent. A few days later we determined the hemoglobin content of the blood of a big, energetic and athletic looking, medical student at the University. At eight o'clock in the morning his hemoglobin content was 128 per cent, an hour later, after breakfast, it had fallen to 100 per cent, at one o'clock in the afternoon it was up to 126 per cent. Had I gone to consult a doctor on the morning that my hemoglobin was determined at the laboratory he would in all probability have prescribed a blood building tonic for me, had I waited until afternoon or evening he would have told me that I was in fine condition, never more normal in my life than at just that moment. On the basis of laboratory findings the medical student just referred to would have to be classed as a super normal individual, so far at least as hemoglobin values are concerned—a condition very hard to justify in fact and totally unnecessary to assume in theory.

Now the methods used in determining the hemoglobin in the experiments just quoted were not crude or inaccurate, nor was the technique careless or in any way at fault. Two of the most exact hemoglobin methods known, the oxygen capacity method and the Wong sulphocyanate method, were used and duplicate checks were made with each method making quadruplicate runs on all of the analytical procedures. The blood used was drawn directly from a vein and mixed with scrupulous care before being pipetted. The variations found were due rather to a variety of physiological factors of unknown origin collectively called, at present, for want of a better name, diurnal variations.

The fact that large diurnal variations occur in the hemoglobin content of healthy men and women has been known for a long time. Dreyer, Bazett, and Pierce,[1] in 1920, working at Oxford University, report diurnal variations in the hemoglobin content of men and animals as high as thirty per cent. In 1923 Rabinovitsch,[2] working at the Montreal General Hospital, reported maximum diurnal variations of hemoglobin in healthy individuals as high as twenty-six per cent. We are reporting elsewhere, from this laboratory, the results of a large series of similar values on apparently healthy men and women confirming, in this country, the results obtained by the English and Canadian investigators just quoted.

The causes of diurnal variations in the hemoglobin content of blood are at the present time very poorly understood. Previous workers in this field have connected them with such variable factors as pulse rate, blood pressure, rate and volume of respiration, fluid absorption and kidney secretion, with the effect of cold on capillary circulation. Barcroft[3] has recently considered the contraction of the spleen, following hemorrhage and exercise, as an early and useful, but not indispensible, "fine adjustment" of the body tending to add to the blood volume. The regulation of the quantity of the blood, both as to erythrocyte count and hemoglobin value, by lienal contraction, following such conditions as asphyxia, work, and exercise has also been recently discussed by a number of investigators. The work of Cruickshank,[4] Scheunert, and Krzywanek,[5] Binet and Williams,[6] Hall and Gray,[7] Himwich and Barr,[8] and others shows unmistakably that contraction of the spleen is respon-

sible for the marked changes in red cell count observed in the conditions just mentioned. It seems not at all improbable that splenic contraction will also be found to contribute largely to the observed diurnal variations in hemoglobin values.

There are at the present time, in this country, three widely used standards from which so called normal hemoglobin values are calculated, viz. the Haldene standard, the Williamson standard, and the Haden standard. These standards all postulate or set up a hypothetical normal adult individual whose hemoglobin is arbitrarily given the value of 100 per cent. There is no hemoglobin standard for children. Haldane and Williamson set their standards from average values obtained exclusively from men. Hayden's standard value includes both adult men and women.

The Haldane[9] standard dates from the year 1900 and is based upon data obtained from 14 apparently normal men. The hemoglobin values in the cases studied varied from 11.9 grams of hemoglobin per 100 c.c. of blood to 15.6 grams of hemoglobin, the average value of all cases being 13.8 grams hemoglobin. In this standard an oxygen capacity of 18.5 c.c. O_2 (13.8 grams of hemoglobin) is assigned a hemoglobin value of 100 per cent. For 12 women, varying in age from 35 to 72 years, Haldane[10] in 1901 reported hemoglobin values varying from 11.2 grams hemoglobin to 13.3 grams hemoglobin with an average value 12.3 grams hemoglobin per 100 c.c. of blood. For children, both male and female, varying from 4½ to 15 years of age, he reported hemoglobin variations from 11.6 grams hemoglobin to 12.7 grams hemoglobin with an average value of 12.0 grams hemoglobin for 100 c.c. of blood. A standard for women and children has never been set up from this data, all determinations on women and children being referred to the 18.5 c.c. oxygen value obtained for men.

Williamson[11] in 1916 measured the hemoglobin content of over 900 men, women and children making use of a spectrophotometer in determining the hemoglobin. His average value for males, between the ages of 16 and 60 years, is 16.92 grams hemoglobin per 100 c.c. of blood, for women between the ages of 16 and 60 years the value is 15.3 grams hemoglobin. For males, between the ages of 60 and 70, the value is 15.49 grams hemoglobin, females 15.22 grams. For children the value at birth is highest, 23.25 grams hemoglobin, and reaches its minimum at the beginning of the second year, 12.53 grams hemoglobin per 100 c.c. of blood. An average value with such extreme variations does not of course permit setting up of a standard for children. The average value obtained for males, 16.92 grams, is taken as a standard value and given a hemoglobin value of 100 per cent. Hemoglobin determinations made on women must when using this standard be referred to the standard established for men in spite of the fact that this value is more than 10 per cent higher than the experimentally observed average for women.

Haden,[12] in 1922, proposed a hemoglobin standard based on a combination of hemoglobin values and red cell counts. His series includes 52 apparently normal individuals. In men, between the ages of 18 to 30, he found an average of 5.08 million red cells and 15.83 grams hemoglobin per 100 c.c. of blood. Reducing the hemoglobin figure obtained to 5 million red cells the hemoglobin value becomes 15.57 grams per 100 c.c. of blood. In men, from 30 to 50 years of age, he found an average red cell count of 4,865,000 and a hemoglobin value of 15.23 grams per 100 c.c. of blood. On the basis of 5 million red cells the hemoglobin value becomes 15.65 grams per 100 c.c. of blood. In women (12 cases) he found an average cell count of 4.26 million red cells and 13.34 grams of hemoglobin per 100 c.c. of blood. On the basis of 5 million red cells the hemoglobin value becomes 15.65 grams per 100 c.c. of blood. The average hemoglobin values for all cases studied was 15.6 grams hemoglobin (20.9 c.c. O_2) per 5 million red cells. This value was proposed by Haden as a standard 100 per cent hemoglobin value.

It will be seen that by referring hemoglobin values to a definite erythrocyte

count of 5 million cells Haden finds that the average hemoglobin values for both men and women coincide with the general hemoglobin average for the entire group studied, thereby eliminating a double standard. The figure proposed by Haden is therefore the most representative that we have at the present time.

The assumption, by Haden, that 5 million red cells constitute a normal erythrocyte count is, in the light of recent work open to serious doubt. Osgood[13] working at Portland, Oregon, reported in 1926 an average erythrocyte count of 5.39 million red cells in 137 healthy young men. For 100 normal women Osgood and Haskins[14] found an average erythrocyte count of 4.80 million red cells. Wintrobe and Miller[15] working at Tulane University, New Orleans, reported in 1929, an average erythrocyte count 5.85 million red cells in 100 healthy young men. Wintrobe[16] in 1930, reported average red cell counts of 4.93 million in 50 normal women. Haden's average figure for 12 women in Kansas City, Missouri, was 4.26 million red cells. Haskin's and Osgood's figures as well as those of Wintrobe and Miller represent sea level values and those of Haden an altitude well under 1,000 feet. It may be therefore that a geographical distribution exists so far as normal average erythrocyte values are concerned. More data than is at present at hand will of course have to be accumulated before this can be said to be established. Another source of error in all hemoglobin standards at the present time is the fact that diurnal variations have not been taken into consideraion. This error may at times be greater than that due to the eryhrocyte count.

Enough data has been presented I hope to show that we are in a terrible confusion as regards an adequate hemoglobin standard. Nor is it going to be easy to get order out of this confusion. The first step in this direction is to drop once and for all the assumption of a 100 per cent normal individual. Hemoglobin values should be recorded only in grams of hemoglobin per 100 c.c. of blood. This movement is happily on foot and making considerable head way. If standard values are to be set up at all the very best that can be done with our present data is to set up a series of normal standards based on age and sex similar to those now in vogue in calculating basal metabolic rates. It seems very questionable whether under any conditions a standard for such a substance as hemoglobin should be based on experimentally determined average values. We measure excellence in intellectual, athletic and other pursuits by maximum performance rather than by average ability. Would it not be better for us to say that the ideal hemoglobin value should equal the value obtained in the highest five or ten per cent of a large group of healthy individuals? Polycythemia is far less prevalent and unrecognized as a pathological entity than are the mild anemias and chances are that standards obtained from apparently normal individuals on the basis of maximum performance would be far less "contaminated" by unrecognized pathological "over counts" than possible anemic "under counts." It must be clearly recognized also that so long as diurnal variations continue to complicate our arriving at a constant hemoglobin value during a single day no standard can be considered as being accurate. Until we have discovered some method of correcting for diurnal variations or establishing a set of conditions that give comparable values in different individuals at some definite hour of the day any standard that may be established in the future will continue, like present day standards, to have a potential error of from one to 30 per cent due alone to these causes.

REFERENCES

1. Dreyer, G., Bazett, and Pierce, H. F.: Lancet 2: 289, Aug. 7, 1920.
2. Rabinowitch, I. M.: J. Lab. and Clin. Med. 9.120-123, Nov. 1923.
3. Barcroft, J.: Am. J. Med. Sc. 179: 1-10, Jan. 1930.
4. Cruickshank: J. Physiol., 1926, 61, 455.
5. Scheunert and Kryzwanek: Pfluger's Arch., 1926, 213, 204.
6. Binet and Williamson: Compt. rend. Soc. de biol., 1926, 95, 151, 262.
7. Hall, F. G., and Gray, I. E.: J. Biol. Chem., 1929, 81, 589.
8. Himwich, H. E., and Barr, D. P.: J. Biol. Chem., 1923, 55, 525, 539; 1923, 57, 363.
9. Haldane, J., and Smith, Lorrain: J. Physiol., 25, 331, 1900.
10. Haldane, J., J. Physiol., 26, 497, 1901.
11. Williamson, C. S.: Arch. Int Med.: 18, 505, 1916.
12. Haden, R. L.: Arch. Inter. Med: 31, 765, 1923; J.A.M.A.: 79, 1496, 1922.

13. Osgood, E. E.: Arch. Inter.: Med., 37, 685, 1926.
14. Osgood, E. E., and Haskins, H. D.: Arch. Inter. Med., 39, 643, 1927.
15. Wintrobe, M. M., and Miller, M. W.: Arch. Inter. Med., 43, 96, 1929.
16. Wintrobe, E. E.: Arch. Inter. Med., 45, 287, 1930.

Obstruction of Small Intestine Due to Neoplasm

C. C. Nesselrode, M.D., Kansas City

We are presenting this case because of a number of points of especial interest as well as the relative rarity of this type of pathology. The patient is Mrs. H., age 60 years, born in France and regarded herself as being perfectly well until approximately three weeks ago. She was admitted to St. Margaret's Hospital on August 18, 1930. During the past three years she has had some recurring attacks of what she called "stomach trouble." These attacks were characterized by more or less abdominal distress and occurred at irregular intervals. She could not prove that these atacks bore any particular relationship to what she ate. She has been more or less constipated, has had no attacks of diarrhoea and has never seen blood or mucus in the stood. Just one year prior to her entrance to the hospital, she had one of these so-called stomach attacks which was unusually severe and was accompanied by some rather severe abdominal cramps. However, this attack lasted less than one day. Since the more severe attack, the other attacks have been more frequent and each attack accompanied by nausea, but at no time did she actually vomit. The present attack began on August 12, 1930, she had severe abdominal cramps and some nausea. The following day she actually vomited for the first time. The cramps were intermittent, the point of greatest intensity she indicated to be in the region of the umbilicus. The cramps have recurred at intervals of a few moments to an hour or more and have varied in intensity, but she has experienced no period of relief longer than three hours. She has vomited on an average of twice daily. Two days before her admission to the hospital, the frequency of vomiting had increased to approximately every two hours. Nothing unusual in the character of the vomitus, rather foul odor and no blood has been seen in it. During the six days that intervened between the onset of the present attack and her admission to the hospital she had on an average of four to six thin stools every day, no blood noticed but a considerable quantity of mucus. The morning of admission to the hospital there was discovered in the stool some blood.

The patient's husband had been ill for the past several months and three weeks prior to her admission to the hospital, he was operated upon in another hospital and died the day preceding the admission of this patient to St. Margaret's Hospital.

EXAMINATION

She has lost several pounds in weight during the past six months. She is the mother of five children, all living and in good health. She is 5 ft. 3 inches tall. Present weight estimated 90 lbs., and appears to be of the age stated. The skin is very dry and quite wrinkled. She is not jaundiced. Looks very much depressed, presumably because of the recent death of her husband as well as the discomfort suffered during the past six days.

Head: Negative except for the expression of distress, deep heavy rings about the eyes and a very dry tongue, showing evidence of dehydration.

Neck: Negative. No palpable enlargement of thyroid or lymph gland.

Chest: Flat, no visible deformity. Expansion poor. Heart and lungs apparently normal. Apex in 5th interspace. No murmurs heard. Pulse 96, regular and good volume. Blood pressure 182/90. Peripheral arteries definitely sclerosed.

Abdomen: Skin dry, much wrinkled and moderately distended; with distended coils of intestines visible through the abdominal wall. At times visible peristalsis. There are no palpable masses to be felt. Rectal and vaginal examination negative.

Extremities: Negative.

IMPRESSION

She has a very definite history of recurring attacks with abdominal cramps, present attacks beginning six days ago and vomiting beginning five days ago. Throughout the attacks some thin

watery stools with a considerable amount of mucus and on the morning of the date of admission, some blood in the stool. On abdominal examination coils of distended intestines were visible and there was evidence of a marked hyperperistalsis. It was obvious that she had a partial obstruction of the bowel, perhaps at times complete obstruction.

The patient would not consent to operation, stating that her husband had just died and that she would be glad to follow him. Repeated enemas failed to give relief. She was given normal salt solution beneath the skin during the first 24 hours in the hospital. She had 2,000 c.c. of normal salt solution and 2,000 c.c. of 2 per cent glucose. She felt considerably improved the following day but was still having cramps. The enemas had procured some gas but the coils of intestines still remained distended and she again refused operation.

On the date of admission to the hospital, the stomach analysis showed no free hydrochloric acid, total acidity 8 points and benzidine tests positive for blood. On the same day she showed positive blood in the stool. Urine was negative. Red count 4,500,000, hemoglobin 85 per cent, 13,750 leucocyctes and 84 per cent polys.

Her condition remained much the same. Enemas sometimes procured gas, but at no time was the abdominal distension relieved. On the 24th of August at the same time that an enema was given, one ampule of surgical pituitrin was given. Following the pituitrin her abdominal cramps were particularly severe and the following morning, August 25, 1930, she consented to operation. The abdomen was opened under local anesthesia and almost immediately there was located a mass which involved one loop of small intestine and when delivered out of the abdomen proved to be a pedunculated tumor of the small intestine with intussusception. This was untangled and there remained a pedunculated tumor projecting into the lumen of the small intestine. This was attached to the free border and the point of attachment was quite irregular in outline. The impression was papilloma of the small intestine, whose base had undergone a malignant change. A coil of intestine some 12 inches in extent was left outside of the abdomen, the peritoneum being attached to the mesentery of this loop. That evening the coil of intestine was opened proximal to the tumor, thus establishing an enterostomy. Immediately there was free drainage of the intestines, the cramps ceased and the patient began to take food. On August 30, 1930, again under local anesthesia, this loop of intestine which had been rendered extraperitoneal was resected. The patient continued to improve and one week later, on September 7, the resected ends of the small intestine were freed and end to end anastomosis done and mesentery repaired. The repaired loop was dropped back into the abdomen and the abdomen closed in layers without drainage. She made an uneventful recovery. This resected loop of intestine was sent to the pathological laboratory, University of Kansas, for study. The laboratory report follows:

GROSS PATHOLOGY

Specimen consists of a segment of the small intestines measuring 9½ cm. in length and 3½ cm. in diameter. The edges are cut irregularly and protruding from the distal end is a polypoid somewhat roughened mass measuring 27 by 23 mm. This mass is somewhat dome shaped, is grayish-red in color and appears to be attached by a long pedicle which is adherent to the mucosa of the intestine along the free margin.

The outer surface of the intestine is covered by a roughened fairly thick layer of fibrin, gray in color. On one side is a knob-like projection corresponding to the internal attachment of the polypoid mass on the inside. This knob-like projection is irregular, firm and measures 37 by 28 mm. and projects above the surface of the rest of the intestine from 6 to 11 mm., the thickest portion being at the free margin and its summit being rough, reddened, and containing fibrin. The wall of the intestine is thickened especially in the serosa and subserosa. The mucosa is thickened, gray in color and is thrown into rather large folds.

The polypoid mass described above, on internal examination shows it to be attached by a pedicle measuring 22 mm. to its base which is at the free edge and which externally forms the knob-like structure described. The attached portion of the mass is large and firm and takes up about one-half of the lumen of the intestine. Its measurements are 27 by 32 mm. It cuts with resistance and the cut surface of the base of the polypoid mass appears gray and cellular and contains small areas of hemorrhage. Cut section of the head of the polypoid mass shows a hemorrhagic appearance and it is quite firm in consistency. The side opposite to the lumen of the intestine shows fibrin in the surface.

HISTOLOGICAL PATHOLOGY

The mucous membrane of the small intestine shows some desquamation of the surface epithelium with considerable mucus on the surface and presents a picture of a mild chronic catarrhal inflammatory reaction. The muscularis is thickened. In the subserosa in some places a fibrinopurulent exudate may be seen. In other places a distinct organizing inflammatory exudate can be seen. In still other fields there is a fairly sharply outlined nodule that extended in the submucosa, pushes the muscularis up to one side and is composed of interlacing bundles of what apparently are smooth muscle fibers, many of which are rather poorly formed. In some places this structure looks like a fibroma, in other places is much more like a myoma. It apparently has its origin in the muscularis mucosa. The tumor tissue is rather loose, is very vascular and shows a few diffuse hemorrhages. A hemorrhagic tendency is seen in the wall of the gut in some locations.

DIAGNOSIS

Myoma of the muscularis mucosa with considerable secondary inflammatory reaction and organizing fibrinopurulent peritonitis as well as a chronic catarrhal enteritis.

The peritonitis here present is undoubtedly secondary to the exposure of this loop to the outside world for a period of one week before its rection.

DISCUSSION

Papilloma of the stomach and small intestines is a relatively rare lesion but occurs frequent enough that it must be given consideration as a possible cause of obstruction. This woman's history of recurring attacks of partial obstruction is quite characteristic of this condition. The intussusception which this woman had as a complicaing factor undoubtedly resulted from the administration of the pituitrin and it was this complete obstruction with increased severity of cramps that compelled her to finally consent to operation. We are certain that the multiple stage operations followed in this case was a life saving procedure.

Our chief object in wanting to present this case is:

1. To demonstrate a case of partial intestinal obstruction resulting from a pedunculated growth of the small bowel.
2. That these pedunculated growths may give rise to intussusception with resulting complete obstruction.
3. That these frail old people if handled with care can be successfully carried through a major surgical procedure.
4. That in the careful handling of these old people local anesthesia plays a very important part.

In concluding we want to stress the importance of the use of sodium chloride and glucose solution in the care of these patients and particularly in the preparation of these patients for any surgical procedure and to again repeat that local anesthesia is a valuable agent.

———B———

The Position of Surgery and Radium in the Treatment of Oral Cancer

EARL C. PADGETT, M.D.
Department of Surgery

The general practitioner is often more concerned than any of us in the care of the individual patient suffering from cancer. To him falls the onus of early diagnosis and finally all too often the unpleasant task of managing the euthanasia.

The aspects of cancer in and about the oral cavity are somewhat protean. To properly select the best treatment at the present time for the individual patient

requires a triumvirate of knowledge—namely, of pathology, of radiology and of surgery. Surgery or radium or both are our weapons and the attack is planned when a cure seems probable or possible so as to completely encompass the anatomical and pathological necessities of the given case.

Contrary to a somewhat general skepticism epidermoid carcinomata in and about the face, mouth and jaws has a fair prognosis when a consideration of all phases of the picture are taken, and sound methods of attack used where and when they are indicated. The end results of treatment of carcinomata in this region depend upon the completeness of eradication of the local lesion and the tributary lymphatic areas. Fortunately the collar of lymphatics about the neck forms a barrier which usually prevents metastasis below the collar bone. In balancing the factors for and against a given method the same rules will not hold for the local lesion as for the embolically filled tributary lymphatics. Radium does not effect the metastatic squamous cell carcinomata in the lymph nodes as favorably as it effects the local lesion. As a matter of fact, there is no good evidence that radium has ever cured metastatic squamous cell carcinomata, at least, of the more differentiated type in the lymph nodes of the neck.

Relative to the treatment of local lesion, it should be mentioned that when bone is involved, radium does not effect a cure unless bone necrosis is produced; consequently, as a rule, excision becomes obligatory; and secondly, that by treatment with radium in the tongue and floor of the mouth group, Regaud's[59] large series show only about 42 per cent of the local lesions without regard to time, to have been healed. Thus, in this group, at least, the chances are less than one-half that the local lesion will be affected favorably.

It seems germane to review briefly certain fundamental conceptions which should influence in a rough way our decision. The law of Bergonie and Tribondeau[2] states that "immature cells and cells in an active state of division are more sensitive to irradiation than cells that have already acquired fixed adult morphologic and physiologic characters." This was the conception for the start of irradiation therapy. Later Barlow showed that cells in an active state of division are about seven times more sensitive to irradiation than resting cells. Wood and Prime[69] then brought out the fact that an ordinary cancer cell requires from four to six times a "skin erythema" dose for its destruction. Just recently Martin and Quimby[71] have calculated the actual intensity of dosage in a large series of successfully treated cases by radium and have found that for the adult type of carcinomata, a dosage intensity ranging somewhere between seven and ten "erythema doses" is apparently necessary for the successful eradication of the disease. To give seven to ten times the "skin erythema" dose to a tumor over a period of time—a week or ten days—without causing skin necrosis, all the alpha and beta rays—practically speaking—must be filtered out and only small quantities of radium used. So that when one is going to use radium even where it is indicated it is necessary to use it correctly and thoroughly with the proper filtration for the proper length of time or else radium therapy is of no great value.

Broders,[3] as is quite generally known, promulgated the idea of grading the relative malignancy and of forecasting the prognosis by estimating the percentage of undifferentiated cells in a given new growth. Later, from Broders' conception Ewing[23] conceived the idea of classifying epidermoid carcinomata as to degrees of radiosensitivity. These ideas taken along with the clinical characteristics of the new growth in a general way (as McCarthy[44] has pointed out) should aid one in selecting the best treatment for the individual case. The point of the question being that in so far as treatment is concerned the tumor which is least radio-sensitive shows the highest percentage of cures by proper surgical eradication. On the other hand the tumor most susceptible to irradiation shows the least percentage of cures following surgical excision. And in certain tumors logical reasoning suggests that the indi-

vidual chances of a cure are increased by the use of both irradiation and surgery. Thus the question is never one of irradiation versus surgery but whether or not after a study of the clinical and microscopic picture, experience indicates that the choice of therapy should be surgery, radium or both.

The preceding statements might lead one to assume that the dividing line for the local lesion—at least—is clean cut. Unfortunately, it is not. As Wood[74] has pointed out the practical difficulties are many and there is even some experimental work which would indicate that different tumors of the same cellular morphology may vary in radiosensitivity. As yet about all the definiteness that experience justifies in so far as epidermoid carcinomata is concerned is that the basal cell tumors are sensitive and squamous cell tumors are resistant while mixed types lie in between. But in the mixed types fall the three distinctly radio-sensitive tumors which have been freshly described rather recently and should be distinguished by biopsy early so as to be selected for radiotherapy. They are the transitional cell epitheliomata (Ewing[23]) the lympho-epitheliomata (Regaud) and a tumor with very little tendency to keratinization, not infrequently called a reticulum-cell sarcoma (Quick and Cutler.)

In the treatment of metastatic epidermoid carcinomata not already advanced beyond the confines of the capsule of the lymph node, radium has little or no place. Representatives of three of the good radium institutes (Regaud,[58] Quick[57] and Forssel[28]) have no absolute record of an irradiation "cure" in squamous cell carcinomata after it has reached the lymphatic nodes of the neck. There is evidence which would indicate that in squamous cell carcinomata of the lip bloc removal of the tributary lymphatic areas will raise the percentage of "five year cures" about thirty per cent. And in intraoral carcinomata as a whole, similar evidence seems to indicate that neck dissection en bloc raises the percentage of "five year cures" about ten or twelve per cent.

The question has been discussed in this country whether or not one should do a routine neck dissection even when the nodes are not palpably enlarged. At the Memorial Hospital, Quick[57] has taken the stand that it is not good surgery to do so. Ewing[26] and Quick[57] have felt that the cervical lymph nodes perform a conservative function up to a certain point but the evidence for this idea is inconclusive to say the least. Most other good clinics in this country have not come to Quick's position. Most experienced clinicians agree that it is impossible to tell clinically whether a lymph node is microscopically involved with cancer or not. To be somewhat lenient with Quick's position, it is probable that if the patient would return to a careful observer every month or two for the rest of his life and that immediately on the evidence of suspicious enlargement of the lymph nodes subject himself to proper surgery of the area, the percentage of "five year cures" would probably not be decreased perceptibly. If the ordinary individual could be depended upon to act in this manner some unnecessary surgery might be prevented but everyone knows the difficulties encountered in keeping in contact with the average patient as soon as he has no perceptible lesion. In Quick's series of 555 carcinomata of the lip 202 were lost trace of.

BASAL CELL CARCINOMATA OF THE SKIN

Basal cell carcinomata of the skin—the so-called "rodent ulcer"—can be cured as a rule either by total excision or by radium. The method of choice depends on the size of the lesion, its duration and the location. As it does not metastasize it is not necessary to consider the tributary lymphatic structures.

EPIDERMOID CARCINOMATA OF THE SKIN

In the epidermoid carcinomata of the lip, radium causes the local lesion to heal in most of the cases. But surgical exicision followed by simple plastic surgery shows as good or better results with no more resulting deformity than that caused by radium. Surgical treatment allows a microscopic examination of the lesion, which we feel is important in the proper study of a given case. Small early relatively differentiated

cancer of the lip possibly does not need an excision of the related lymph nodes. In all other cases of lip cancer, a neck dissection including the submental and submaxillary triangles is indicated except the inoperable fixed carcinomata which are best treated palliatively by radium.

The surgical results may be fairly accurately represented by those given by Brewer,[15] who united the cases of several of the best American clinics. Those cases without involvement of the lymph nodes in which the lymph nodes were removed showed 92 per cent remaining well for 5 years or more. In the same group if the lymph nodes were not removed the 5 year cures fall to a percentage of 62 per cent. When the lymphatic nodes were already involved 34 per cent remained well for 5 years or more.

The statistics that can be presented for radium might be fairly well represented by those of Ragaud[59] which were reviewed December 31, 1927, and are tabulated so that they can be reduced to five year cures. Thirty per cent of his cases were classed as operable and 24 per cent as questionably inoperable. Twenty-eight per cent are living five years or more after treatment. Another point of interest in Regaud's cases is the percentage of clinical disappearance of primary lesions treated, which were in the inoperable cases 17.8 per cent, in the questionable operable 91 per cent and in the operable cases 98 per eent.

EPIDERMOID CARCINOMATA OF THE CHEEK

When epidermoid carcinomata of the cheek is anaplastic and nondifferentiated microscopically and highly malignant clinically, radium may be the best treatment for the local lesion but in the less anaplastic more differentiated types, surgery should be considered the method of choice. An unilateral dissection of the neck *en bloc* should be done when a cure is attempted. Simmons[64] in 13 cases treated by surgery reports 52 per cent cures for four years. On the other hand, Brewer[15] quotes 15 cases treated by radium show 35 per cent cures for three years. Quick's cases (185) show a considerably lower three year cure period (11.4 per cent.)

CARCINOMATA OF THE PARANASAL SINUSES

After radical surgical resection alone it is somewhat unusual to have a case of carcinomata of the paranasal sinuses live as long as one year. Thus, it is rather generally agreed that the best treatment is offered when free exposure and free drainage is given by surgery (Regaud[59] even resects the superior maxillae) and radium is depended upon to effect the actual cure. A soldering iron is inserted into the antrum from below—sometimes through the lateral part of the palate and alveolar ridge—and under low grade heat the antral cavity hollowed out. A neck dissection should be done in the more differentiated squamous cell lesions on the side of the lesion but it would seem hardly worthwhile in the very anaplastic or the more radiosensitive lesions. External radiation to the neck would seem preferable.

CARCINOMATA OF THE PHARYNX

A high percentage of the carcinomata of the pharynx are of the transitional cell variety and are often of grades III and IV (Broders), which theoretically should mean that a considerable percentage should be radiosensitive and that the cures with radium should be encouragingly common but statistics show that the hoped-for results have not been obtained as yet. When moderately early carcinomata of moderate grade malignancy are found in the pharynx, surgical treatment can be instituted with some hope of success, the method of choice is excision of the local growth with diathermy or cautery and dissection of the glands of the neck. Advanced or recurring carcinomata or moderately advanced carcinomata of undifferentiated microscopic appearance and clinically of the more malignant type and which show a morphological picture suggestive of considerable radiosensitivity are probably cases for radium alone and neck dissection is often useless. Every tumor presents its individual problem because of location, grade and malignancy and extent of metastasis and surgery by cautery or diathermy and radium or a combination of the two may

all come into play for the best possible result.

In Quick's[54] 51 followed cases of carcinomata of the pharynx treated by radium, reported at the end of 1928, 5 or about 10 per cent are free from disease clinically and 3 of the 5 have been treated less than 3 years. Neoplasms of the tonsil show a somewhat better record with radium than carcinomata of the pharynx but unfortunately biopsy is often not considered advisable in this region. About 10 per cent of Quick's 242 cases are well over 3 years. On the other hand, New's[45] statistics of nasopharyngeal and pharynx neoplasms including the tonsil in which a combination of surgery and radium was used in 45 cases show 29.7 per cent living on an average of about 28 months at the time of his report (1926.)

EPIDERMOID CARCINOMATA OF THE TONGUE AND NEIGHBORING MUCOSA

In cancer of the tongue and neighboring mucosa, especially if the lesion be in the forward two-thirds, wide excision of the local growth with a cautery knife or by electro-coagulation methods can be fairly advocated as most likely to effect a cure. It might be best to except from the foregoing group those cases in which the clinical picture is of rapid growth and microscopic examination shows the growth to be rather anaplastic and undifferentiated, and to consider radium application as preferable when good radium facilities are available. When striving for a complete cure in cancer of the tongue and neighboring mucosa dissection of the neck on one or both sides as indicated is to be advocated.

Butlin[12] many years ago presented surgical statistics which are still of interest. In 197 tongue cases he had twenty operative deaths (10 per cent) but 31 per cent of the cases lived over three years. Of 44 cases on which gland dissections were not performed 29 per cent showed cures and of 57 cases which had gland dissection 42 per cent showed cures. His cases were moderately advanced and speak for gland resection.

Although some increase in cures of advanced cases has been made by some such men as Blair[4] by unusually radical surgical methods, the mortality and mutilation is correspondingly increased.

One can state that the statistics of Butlin,[12] Bloodgood,[14] Judd,[36] New[36] and Blair[4] indicate that surgery alone when properly done in cancer of the tongue and floor of the mouth offers about 60 per cent chance of cure in the early cases and from 30 to 40 in the moderately advanced cases and 20 to 25 per cent chance of a cure in the advanced cases, when operated on by very radical methods. The operative mortality could probably be placed at 20 per cent in the advanced cases radically operated by the methods advocated by Blair.[4] From this high point the operative mortality should fall to practically no deaths in the early lesions.

On the other hand, radium statistics may be represented by those of Regaud[59] Paris. His statistics for cancer of the tongue and floor of the mouth, which includes all cases seen, are revised to December 31, 1927. When reduced to 5 years or longer cures, show 121 cases with 17.3 per cent (21) clinical cures. His three year cures figured on the same basis show 230 cases with 18.2 per cent (42) clinical cures. The primary localization was arrested for the time being in 43.8 per cent of the cases or less than one-half of the cases. Forssel[28] (Stockholm) presents 160 cases of mouth cancer, 72 of which had lymph node involvement. In none of the 72 cases was there a single one year cure for radiation alone. By surgery of the glands combined with radiation he obtained 35 per cent three year cures and 30 per cent five year cures (10 out of 27 cases.)

CONCLUSION

In conclusion it seems logical to suggest that the best methods of treatment for the individual case should occur when the cellular characteristics, the probable irradiation response and the chances for cure by excision methods are all considered. In certain cases excision methods used along with radium increase the chances of a cure. It must be remembered that after all if the treatment — whatever the type — is not planned on a scope sufficient to get be-

yond the farthest extension of the disease or in other words does not meet the pathological necessities of the case, no hope for an ultimate cure logically can be entertained. He who presumes to treat cancer should have a well balanced combination of pathological, radiological, and surgical knowledge and should be in a position to use all three.

BIBLIOGRAPHY

1. Apolant, H. Ueber die Einwurkung von Radium Strahlen auf das Karzinom des Mause Deutsch. Med. Wchnschr. XXX:454, 1904.
2. Bergonie, Tribondeau and Racamier: Soc. de Biol. p. 284, 1905.
3. Broders, A. C. Squamous Cell Epitheliomata of the Lip, J.A.M.A., LXXIV:656, 1920.
4. Blair, V. P., Brown, J. B. and Womack: Ann. of Surg., XXVIII:705, 1928.
5. Bloodgood, J. C.: Radiosensitive Tumors and Tumors that First Should be Subjected to Operation, Radiology, XIV:254-262.
6. Birkett, G.: Radium Treatment of Carcinoma of the Mouth and Tongue, Lancet, CCXIV:953, 1928.
7. Basford, E. F., Murray, J. A. and Cramer, W.: The Growth of Cancer Under Natural and Experimental Conditions, Scien. Report, Imp. Canc. Res. Fund, Part 2, 1905.
8. Burnam, C. F.: Radium in Intra-Oral Cancer, Radiology, IX:366, 1927.
9. Berven, E.: Operative and Radiological Treatment of Malignant Tumors of the Mouth, Acta, Radiol. VIII:472, 1927.
10. Broders, A. C.: South, M. J. 74:656, 1925.
11. Broders, A. C. M. J. and Record, 121:33, Feb. 4, 1925.
12. Butlin, Henry T.: Brit. M. J. 1:1-6, 1909.
13. Blair, V. P.: Surg. Gynec. Obst. 36:178, 1923.
14. Bloodgood, J. C.: Boston M. and S. J. 120:49, 1914.
15. Brewer, G. E., Surg. Obst. Gynec., 36:169-177, 1923.
16. Crile, G. W.: Surg. Gyn. Obst. 36:159-162, 1923.
17. Cade, Stanford: Radium Treatment of Cancer, Wm. Wood and Co., N. Y., 1929.
18. Coutard, H.: Roentgen Treatment of Carcinoma of the Tonsils. Strahlen therapie. XXXIII:249, 1929.
19. Duffey, J. J.: The Cervical Lymph Nodes in Intra-Oral Carcinoma, Radiology, IX:373, 1927.
20. Ewing, J.: Am. J. Roentgenol. 9:334, 1922.
21. Ewing, J.: Factors Determining Radio-resistance on Tumors, Radiology, 14:186-190, March, 1930.
22. Ewing, J., Greenough, R. B. and Gerster, J.C.A.L. Medical Service Available for Cancer Patients in the United States, Suggestions for Its Improvement, J.A.M.A. 93:165-169, July 20, 1929.
23. Ewing, J.: Radiosensitive Epidermoid Carcinomas, Am. Jour. of Roent. and Rad. Ther. XXI:318-321, 1929.
24. Ewing, J.: An Analysis of Radiation Therapy in Cancer, Trans. Col. Phys., Phil. XLIV, 1922.
25. Ewing, J.: Factors Determining Radio Resistance in Tumors, Radiology, 14:106.
26. Ewing, J.: Some Phases of Intra-Oral Tumors, etc., Radiology, IX:359, 1927.
27. Ewing, J.: Radiosensitivity, Radiology, XIII:313-318, 1929.
28. Forsell, Gosta: The Radio-therapeutic Clinic of the Cancer Assn. Stockholm Radium Hemmat, Acta, Radiol. LX:315-369, 1928.
29. Forsdike, S.: The Effect of Radium on Living Tissues, London, 1923.
30. Greenough, R. B.: New Eng. J. Med. 201:1287-1289, 1929.
31. Greenough, R. B.: Cancer Clinics, New Eng. J. Med. 202:426:430, 1930.
32. Greenough, R. B.: Symposium on Cancer, Introductory Remarks Bull. Am. Coll. Surg., 13:42, 1929.
33. Greenough, R. B.: Progress and Prospect in Treatment of Cancer, Surg. Gynec. Obst. 46:159-160, 1928.
34. Harmen, W. Douglas: Brit. Jour. of Surg. April, 1928.
35. Handley, W. Simpson: Brit. Jour. Radiol. 11:50-64, 1929.
36. Judd, E. S. and New, G. B.: Surg. Obst. Gynec., 36:163-169, 1923.
37. Judd, E. S. and New, G. B.: Surgery in Cases of Intra-Oral Cancer, Radiology, 1927, IX:380.
38. Judd, E. S. and New, G. B.: Carcinoma of the Tongue, etc. Surg. Gynec. Obst. XXXVI:163; 169, 1923.
39. Knox, Leila, C.: Radiosensitivity and Tumor Morphology, Radiology, 11:229.
40. Lacassagne, A.: The Importance of Filtration and Superiority of Pure Gamma Radiation in Radiotherapy of Malignant Tumors, Radiology, XIII:95-102, 1929.
41. Leitch. Archibald, Cancer by Patterson, Wm. Wood and Co., N. Y.
42. Laccassagne, A.: The Direct and Indirect Action of Radiation on Cancer Tissue, Radiology, 11:593.
43. Lenz, M.: Curie Therapy of Epidermoid Carcinoma of the Intra-Oral Group as Carried out at the Radium Institute, Paris, Am. J. of Radiol., XV:210, 1926.
44. MacCarty, W. C.: Principles of Progress in Cancer, J.A.M.A., 96: 30-33; MacCarty, W. C.: Present Status of Knowledge of Cancer, A. Jour. 1931; of Clinical Pathology, 1:85-91, 1931.
45. New, G. B.: Surg. Gynec. Obst. 40:177, 1925.
46. New, G. B.: J.A.M.A. 74:1297 (May 8) 1920.
47. New, G. B. and Kirch, W.: Tumors of Nose and Throat, Arch. Otol. 11:657-668, 1930.
48. Plaut, Alfred: Arch. Path. and Lab. Med. 3:240-267, 1927.
49. Quick, D.: Radium Report for Memorial Hospital, N. Y. City, Paul B. Hoeber, Inc., 1924.
50. Quick, D.: Surg. Gynec. Obst. 70:462, 1926.
51. Quick, D.: J. Radiol. 4:318, 1923.
52. Quick, D.: Brit. Jour. Radiol. 31:81, 1926.
53. Quick, D. and Cutler, M.: Am. J. Roent. 14:529, 1925.
54. Quick, D.: Treatment of Malignant Growths of Nasal Accessory Sinuses and Nasopharynx, Radiology, 14:191-196, March, 1930.
55. Quimby, Edith M. and Pack, George T.: The Skin Erythema for Combination of Two Types of Radiation. Read before Radiological Soc. of North America, Dec. 2, 1929.
56. Quick, D. and Cutler, M.: Surg. Gynec. Obst. XLV: 320, 1927.
57. Quick, D.: Surgery and Radium in the Treatment of Cancer of the Buccal Cavity, Cancer Conference London, 1928. Wm. Wood and Co.
58. Regaud, O.: Brit. J. Radiol. 30:362; 367, 1925.
59. Regaul, O.: Radium Therapy of Cancer at the Radium Inst. Paris, A. J. Reent. XXI:1, 1929.
60. Roux, Berger and Monad, Bull. et. mein. Soc. nat, de Chur., 1927.
61. Regaud, O.: Amer. Jour. Roent. and Radium Ther. Vol. 1, 1929.
62. Sistrunk, W. E.: Ann. Surg. 73:521-526, 1921.
63. Simmons, C. C.: Am. J. Roent. 13:545-550, 1925.
64. Simmons, C. C.: Cancer of the Mouth. The Results of Treatment by Operation and Radium, Surg. Gynec. Obst. XLIII:377-382, 1926.
65. Simpson, E. E. and Flesher, R. E.: Radium Emanation in the Treatment of Cancer of the Tongue and Other Parts of the Oral Cavity, Am. J. Roent. XV:204, 1926.
66. Schremer, B. J. and Brown, H.F.R.: An Investigation of the Results Obtained in Cancer of the Tongue by Radium and the Roentgen Rays, A.M.J. of Roent. XV:207, 1926.
67. Von Bonsdorff, I. G.: Soc. International Chem. (11th Congress) 1908, pp. 11, 16.
68. Wood, F. C.: J.A.M.A. 85:1039-1045, 1925.
69. Wood and Prime, Jour. Med. Assn. LXXIV:308, 1920.
70. Wood, F. C.: Immunity in Cancer, Jour. Am. Med. Assn. LXXXV:1039, 1925.
71. Wood, F. C.: The Contribution of Experimental Studies to Radiotherapy, Radiology, XIV:263:266.
72. Wood, F. C.: Cancer Biology and Radiation, Radiology, 11:388-392, 1928.
73. Wood, F. C.: Blair Bell Treatment of Cancer, Atlanta, M.J. 30:209-212, 1927.
74. Wood, F. C.: Radium and Roentgen-ray Therapy, J.A.M.A. 92:802, March 29, 1929, 894, March 16, 1929.
75. Wood, F. C.: Experimental Investigation of Local Therapy, Am. J. Roent. 23:299-303, March, 1930.

Tribromethyl Alcohol (Avertin) As a Rectal Anesthetic

LEWIS W. ANGLE, M.D.

Department of Surgery St. Margaret's Hospital

The presence of pain, fear and excitement have been the body companions of surgery since the advent of surgery to science, but not until the days of Morton and Crawford were those undesirable features divorced from operative surgery, and then not in their entirety, but to such an extent that pain was relieved.

From the days of these two pioneers to the present day many methods of alleviating pain and producing anes-

thesia at operation have been devised and elaborated upon. Roux and Pirogoff in 1846 and 1847 respectively were the first to attempt rectal anesthesia with an aqueous solution of ether and the rectal administration of ether vapor. Following this the advent of local anesthesia caused a wave of enthusiasm, but the frequent incomplete anesthesia obtained by local anesthesia caused a loss of interest in such methods. Gawthmey[1] in 1913 next attempted to produce anasthesia by the rectal injection of an ether and oil solution which has not been very popular due to the uncertain rate of absorption of ether in the oil mixture and the relative short duration of the anesthetic. Therefore, we have apparently been without a desirable rectal anesthetic until 1923 when Willstatter and Duisberg[2] first prepared tribromethyl alcohol, but it was Eichholtz[3] in 1927, who advocated its use as a rectal anesthetic. Since then over 300,000 cases of tribromethyl alcohol anesthesia have been reported in European literature and quite a few in American literature. From the excellent report on these records and our own experience, it seems that this new anesthetic is most adaptable to surgical procedure as a basic anesthetic.

Tribromethyl alcohol has at its command many valuable and agreeable attributes. Chief among which is the ease in which we may produce not only a state of unconsciousness but anesthesia. We are able to produce unconsciousness with no fright on the part of the patient, while he is totally unaware of his future state. What could be more pleasing or acceptable in pediatric surgery or surgery in those individuals who are highly excitable or nervous or that individual who dreads the ordeal of an operation by past experiences.

The individual variations as to susceptibility are present with the use of tribromethyl alcohol as in other anesthetics. The degree of anesthesia obtained with it determines the required amount of ether, gas or local infiltration which may be added safely to a desired degree of anesthesia. The combination of tribromethyl alcohol with inhalation anesthesia seems to produce a state unattainable with a single general anesthetic and approaches Lundy's principle of a balanced anesthesia.

DESCRIPTION

Tribromethyl alcohol or avertin is a white crystaline substance with a melting point of 80° C. easily soluble in water at 40° C. The product for anesthetic purposes is marketed as a clear solution of which 1 c.c. contains 1 gram of the substance, dissolved in amylene hydrate (tertiary amylalcohol). When heated above 45° C. the molecule breaks down with the formation of dibromacetaldehyde and bromic acid. The dibromacetaldehyde is a highly toxic irritant to the intestinal mucosa.

PREPARATION AND ADMINISTRATION

The preparation of your patient is similar to that for any surgical procedure except that the lower bowel should be entirely emptied by the use of an enema the night before operation, and a small enema on the morning of operation. As to the pre-operative administration of drugs, I think it unnecessary to give any. Some users advocate the use of small doses of morphine, while the reports from European clinics show that the vast majority use vernal or a similar drug as preoperative medication. In our series all methods were used and the best results were obtained by the non use of morphine preoperatively.

The drug is best administered in the patient's room where the surroundings can be made quiet and dark which are inducive to sleep. The required amount of avertin is measured and mixed with distilled water (at 35° to 40° C.) a sufficient quantity to make a 3 per cent solution. This solution is thoroughly stirred, and then tested with a few drops of congo red to determine the presence of dibromacetaldehyde. If the solution remains pink after adding the congo red, it is desirable to use, but should it turn purple the molecules have broken down and the solution should be discarded. This test is obligatory before the solution is ever placed into the rectum. One-half hour before operation the solution is introduced into the rectum by means of a small rectal tube or an ordinary

catheter; this being performed very slowly. When completed the tube is clamped off and left in the rectum for a few minutes. Avertin in very small doses acts as an antipyretic, in large doses as a hypnotic, in still larger doses as a narcotic, and lastly as an anesthetic. The therapeutic latitudes of avertin, as stated by the work of Lendle,[4] comes in the sphere of related substances, accordingly this substance takes an exceptional position through its rapid absorbability and simultaneously increased effectiveness. The result of the anesthetic is sometimes dependent upon the blood concentration and the specific coefficient of distribution throughout the body. Only those bodies can be used for rectal methods which are not only quickly absorbed, but which can be easily and completely destroyed by the body. In reality, it has been shown by the work of Parsons, Killian and Schneider[5, 6] that avertin presents these requirements more satisfactorily than any other compound.

The dosage of avertin has been a question of much dispute both among foreign and domestic users, varying from 60 to 130 milligrams per kilogram of body weight. In our series, the dosage ranged from 90 to 110 milligrams per kilogram of body weight (exclusive of obstetrical cases in which 60 milligrams per kilogram of body weight was used.) I do not think we should confine ourselves to the use of body weight as an index to the dose to be used. We arrived at the above figure by taking 100 milligrams per kilogram of body weight as an average in standard and increased or decreased the dose according to the condition of the patient, age and sex bearing an important influence. It has been found that children and young adults require a relatively larger dose than older individuals who are debilitated or those affected with faulty elimination. As to sex, we always used a slightly larger dose for men than for women, never exceeding 10 c.c. for one dose.

ACTION

Once avertin is placed into the rectum the absorption is rather rapid; in 3 to 5 minutes the patient acquires a state of deep slumber and is easily transferred to the operating room. Straub[7] reports that 80 per cent is absorbed in the first 20 minutes and 95 per cent absorbed within the first two hours of the anesthetic, and during the anesthesia Sebening[8] has found it in the blood in a concentration of 6 to 9 milligrams per cent.

The action of avertin on the cardiovascular system shows a slight variation from normal. The pulse volume is good, rate slightly above normal, rarely above 100. There is usually a slight drop in systolic blood pressure, the diastolic remaining constant. The systolic may fall as much as 15 mm. of mercury but soon returns to normal. Unger and May[9] have reported a number of cases in which they used an electrocardiograph and were unable to find any change attributable to the anesthetic. Parsons[5] in his experimental work shows that avertin resembles chloroform in its action upon the heart, but only one-sixteenth as toxic. Therefore, avertin has a relatively low toxicity upon the cardiovascular system.

Common to many anesthetics the respiratory rate is slowed, but is increased in depth. Straub[10] has found experimentally that the respiratory efficiency is maintained by an increase in the depth of breathing. In the body avertin is detoxicated in the liver with the formation of urobromalic acid, a product formed in combination with glycuronic acid. Straub has been able to recover 81 per cent of the drug in the combination from the urine within 48 hours, and Parsons recovered 72 per cent in the same period of time. He also recovered slight traces of bromine in sweat but none from the expired air or feces. According to Parsons' experimental work there are four ways in which it is possible for avertin to be excreted: (1) as sodium bromide, (2) as unchanged avertin, (3) as urobromalic acid, and (4) as an organic compound of bromide other than unchanged avertin or urobromalic acid. White and Kreiselman[11] in a series of analyzed cases report the comparative changes after operation as follows: a slight increase in white blood cells, blood sugar, non-protein nitrogen, pulse rate, respiration rate and systolic blood pressure; a

slight decrease in red blood cells, hemoglobin, chlorides, carbon dioxide and diastolic blood pressure.

POSTOPERATIVE STAGE

In any surgical procedure the postoperative condition of a patient is of great concern to the operator. Patients who have taken an average dose of avertin usually remain in a state of analgesia and amnesia from one to three hours after returning to their rooms. During this time the corneal reflexes are active, the sleep is light, but deep enough to alleviate pain and discomfort. On leaving the operating room the patient as a rule is dry and warm with an unusually pink color, and continuing throughout the postoperative stage, toward the end of which the patient may complain of pain, thirst or hunger, and upon relief he resumes his sleep, which may last several hours. Postoperative distention is remarkably decreased, also abdominal pain which is much less than that following general anesthesia. The patient should be watched continuously by an attendant. The masseter muscles are relaxed, the tongue and jaws drop and the pharyngeal reflexes are diminished. The failure to keep an open airway at all times may result in asphyxia. As a precaution to such difficulties from mechanical obstruction an airway should be inserted as soon as the pharyngeal reflexes are abolished, leaving it in place during operation and during the postoperative stage.

In our series, we have not observed a single case of rectal irritation or mucous discharge from the bowel, post-operative vomiting, no respiratory complications such as bronchitis or pneumonia were seen. In other words, in our series of over 200 cases no ill effects attributed to the anesthetic have been observed.

ADVANTAGES AND DISADVANTAGES

The advantages of avertin are manifold: 1. Prolonged sleep following operation, making it unnecessary to use morphine for the relief of postoperative pain. 2. Complete absence of mental distress or stage of excitement, preoperatively or postoperatively. 3. Decreased nausea and vomiting. 4. Relative infrequency of postoperative respiratory complication. 5. Rapid elimination with no direct injury to the organs involved. 6. Convenient for operation about the head and neck and in all phases of plastic surgery. 7. Especially adapted for thoracic surgery. 8. Of special value in prolonged operation as neural surgery and prolonged abdominal operations. Avertin has been found to be of special value in controlling convulsions in tetanus. In such a condition we have the absence of operation trauma. Therefore, the patient's condition warrants a larger dose. I have seen excellent results obtained in one instance, the convulsion disappearing promptly, but as to the curative phase on the course of the disease, it is uncertain. Lawen[12] reports one case in which he gave twenty anesthesias, one after another without injury to the patient, thereby showing the non-accumulative affect after repeated doses. The disadvantages are few and can be obviated by a careful administration of the drug, by not overheating the solution, guarding against rectal irritation, and I think care should be taken to maintain an attitude of conservatism relative to dosage by not attempting to use avertin as a general anesthetic, but as a basal anesthetic. The contraindications are few and may be enumerated as follows: 1. Advanced diseases of the kidney or liver; 2. acidosis; 3. extreme cachexia; 4. ulcerative diseases of the rectum.

CONCLUSIONS

Our series consisted of the following operations: herniotomies, appendectomies, cholecystectomies, pelvic operations, thora-coplasties, phrenic avulsion, brain tumors and radical antrum operation, plastic surgery and obstetrics.

In all cases we were very conservative regarding the dose and in no case did we attempt to get complete anesthesia with avertin alone, but in two thyroidectomies and two thoracoplastics the operation was completed without the addition of local infiltration or an inhalation anesthetic. In all four of these cases 100 milligrams per kilogram of body weight was given. Very few authors have reported deaths from avertin, but there are some, and a conservative estimate

from the literature would place the rate at 3 in 10,000.[13] Killian[14] reports several deaths after avertin anesthetic, but had not proof that the anesthetic caused death in all cases, due to the fact that a postmortem was not done on all cases. The majoriy of these deaths reported occurred in the years 1927, 1928 and 1929 when doses were used, attempting to use avertin as a general anesthetic, not appreciating it as a basal anesthetic.

This work was done at the Johnston-Willis Hospital, Richmond, Virginia, on the service of Dr. F. S. Johns, and at St. Margaret's Hospital on the service of Dr. C. C. Nesselrode.

LITERATURE

1. Gwathmey, Lancet, 2:1756, 1918.
2. Willstatter, R. and Duisberg, W., Ber. d. deutsch. Chem. Gesellesch, 54:2283, 1923.
3. Eichholtz, Rectal anesthesia with avertin, F. Deutsche Med. Wchnschr., 53:710, 1927.
4. Lendle, Arch. fur Exper. Path. und Pharmakol., 132: 214, 1928.
5. Parsons, F. B., Brit. Med. Jour., 2:709, 1929.
6. Killian, Hans, Experimental Researches on Avertin, Narkose U. Anesth., 119, 1928.
7. Straub, W., Absorption and Dosage of Avertin in Rectal Anesthesia, Muenchen. Med. Wchrschr., 74:593, 1928.
8. Sebening, Surgical Congress, Berlin, 1928. Zentralblatt fur Gynakologie, 25: 1609, 1928.
9. Unger & May, Electrocardiograph Investigation During Avertin Anesthesia, Zentralblatt fur Chirurgie, 51: 3272, 1927.
10. Straub, W., Excretion of Avertin by the Organism, and Its Secondary Effects When Used in Rectal Anesthesia, Muenchen. med. Wchuschr., 75:1279, 1928.
11. White and Kreiselman, Surg. Gyn. & Obst. 51:361, 1930.
12. Lawen, A., Avertin in the Treatment of Tetanus, Zentralbl. f. chir., 54:2370.
13. Killian, Avertin—Rectal Anaesthetic; Results to date, Brit. J. Anesth., 4:168, 1928.
14. Killian, Symptomatic Treatment of Tetanus with Avertin, Zentralbl. f. chir., 55:194, 1928.

TUBERCULOSIS ABSTRACTS

The greater precision of the *x*-ray film, its permanence, and the convenience of studying it at leisure are advantages over the fluoroscopic method. But the fluoroscope is of great value under certain special conditions. Its advantages are chiefly economy of time and money for the examination of large groups of apparently well adults. Some clinicians maintain that with the fluoroscope it is possible to discover the lesions as accurately as, and more quickly than by means of percussion and auscultation. None would deny that a physical and *x*-ray examination is the most accurate. But a physical and fluoroscopic examination is better than a physical alone. Certainly the fluoroscopic method deserves study by those who are interested in finding tuberculosis in groups of college students, employes and soldiers.

THE FLUOROSCOPE IN THE DIAGNOSIS OF TUBERCULOSIS

Reid in 1929 reported on the results of examining applicants for positions in a large insurance company with the fluoroscope. This examination was used at first as an adjunct to the routine physical examination of the chest. The accuracy of the method was tested on 100 persons whose chests were negative on physical examination and were passed fluoroscopically as normal. These were *x*-rayed and the entire group was classified as with "healthy adult chests" by the roentgenologist. Another group of 123 cases in which definite signs were described by the same physician, such as harsh breath sounds, transient rales, and prolonged expiration at the apices, were fluoroscoped, classified, and then *x*-rayed. In only one of these did the *x*-ray show exidences of tuberculosis and this at a very early stage. Reid concluded that "in the absence of physical signs, it is possible to demonstrate pulmonary pathological changes by means of the fluoroscope with sufficient accuracy to render the procedure a most valuable adjunct to the routine physical examination of young adults."—*The Value of the Fluoroscope as an Adjunct to Routine Physical Examination of the Chest, Ada Chree Reid, Amer. Rev. of Tuberc., July 1929.*

FLUOROSCOPE EXAMINATIONS OF UNIVERSITY STUDENTS

Kattentidt reports the findings among students of the University of Munich. In the winter of 1929-30, he made fluoroscopic examinations of 1,768 students (1,363 males and 405 females) as part of the compulsory physical examinations at matriculation. Some evidence of tuberculosis was found in 14.5 per cent. In most cases, the tuberculous lesion was inactive, a few were partially active, but in six cases, or 0.34 per cent of the entire series, there was an open lesion. These six cases all occurred in males. At the same time, 772 students (699 males and 73 females) were examined at their own request. The findings were substantially the same as among the "compulsory"

group. In the previous summer semester (1929), the percentage of tuberculous lesions found in 1,437 male students was 22.6 per cent and 0.49 per cent open lesions, and of 360 female students 15 per cent tuberculous lesions and 0.28 per cent open lesions.

Combining the findings for the two semesters of compulsory and voluntary examinations of 4,836 students of both sexes, the results were as follows

Inactive lesions	14.8 %
Partially active lesions	1.3 %
Active closed lesions	0.17%
Open lesions	0.39%
Total tuberculous lesions found	16.66%

The author cites the findings of Kayser-Petersen and Wiewiorowski, who examined male university students. Adding this series to his own, he finds that in the combined groups of 6,513 apparently healthy young men between 20 and 30 years of age, 30 cases or 0.46 per cent had open tuberculosis. This figure, he believes, represents the incidence of tuberculosis among this group at a certain definite time.

DEVELOPMENT OF ACTIVITY DURING SEMESTER

Further cases of active tuberculosis may develop in the group, as shown in repeated examinations. Thus, of 2,296 students examined in the summer semester of 1929, four more students (male) developed open tuberculosis and one an active closed tuberculosis up to June 25, 1930. Of the students examined in the winter semester of 1929-30, one additional case of active closed tuberculosis developed. Thus, in the course of a year, the incidence of open tuberculosis increased from 0.48 per cent to 0.65 per cent.

Brief clinical histories are given in the eleven cases (eight with open and three with closed lesions) discovered in the winter semester. The lesion was usually of the chronic interstitial type; the sputum was positive for tubercle bacilli in seven cases, negative in three cases and no sputum was obtainable in one case. Physical examination showed no evidence of tuberculosis in seven of these eleven cases. This would indicate that physical examination alone fails to reveal tuberculosis in a larger percentage of cases than has been suspected. In these eleven cases, eight had open lesions as shown by the positive bacteriological findings in seven cases and the clinical findings in one case. Yet none of these showed large areas of destruction; the author has often been surprised to find tubercle bacilli in the sputum in cases in which there was little evidence of a destructive process.

SUPERVISION OF CASES NECESSARY

Continuous supervision of such cases is necessary, however, as shown by the case of one student, who showed hilus changes on her first examination, and no definite changes on re-examination half a year later (no lesions in the pulmonary tissue). Yet ten days after this second examination, this student had a pulmonary hemorrhage, which was thought to be due to bronchiectasis, as the sputum was negative and the red cell sedimentation velocity was normal. As a matter of precaution, she was sent to a sanatorium for observation and there pulmonary focal lesions developed suddenly with positive sputum; the tubercle bacilli persisted in the sputum for several months. This was the only case in which signs of activity developed in cases with inactive lesions within six months. But this is not remarkable, since tuberculosis is a decidedly chronic disease; it indicates that these cases must be kept under prolonged supervision.

Among 44 cases diagnosed as partially active in the summer semester (1929) two students developed symptoms that necessitate sanatorium treatment. In one of these cases, there was an increase in the pulmonary lesion, and the sputum showed a few tubercle bacilli. In the second case, the pulmonary lesions showed little change, but new adhesions had developed, and the patient's general condition was poor.

TYPES OF LESIONS

A study of the types of tuberculous lesions found at the different ages in the 2,540 students examined in the winter semester showed 457 students under

twenty years of age (17 to 19), the great majority over twenty years of age (from 20 to 30 years). The early forms of tuberculous lesions, including exudative pleurisy, occurred only at the earlier ages, mostly at twenty years or younger. Most of the cases of open tuberculosis occurred at twenty-one years of age or later, only two cases at the age of twenty, and none before the age of twenty. The highest percentage of cases of open tuberculosis occurred at the age of twenty-one (in 0.78 per cent of students at this age.) The focus of infection was demonstrable only in six of the nineteen active cases of tuberculosis.

HEALTH CARE OF STUDENTS

The records of the results of the physical examination and of the fluoroscopic examination are filed with the university. The student is also given a printed card showing the result of the fluoroscopic examination, and whether there is any indication of tuberculous lesion in the lung, whether such lesions are entirely inactive or show any signs of activity, and whether any type of athletics is permissible. This brings the patient into contact with the athletic medical director, where this is advisable, and indicates whether further supervision or examination is desirable, or whether immediate treatment is necessary. The author is of the opinion that certain types of sports and gymnastic exercise are of definite value in the treatment of inactive tuberculosis; and that the close co-operation established with the athletic medical direcor by the system adopted is of definite value for the students, and for the further study of the effect of athletics on respiration and circulation in relation to the effects on tuberculosis.—*Fluorscopic Examination in the Second Semester at the University of Munich, B. Kattentidt, Ztschi. f. Tuber., 58:209, 1930 (October.)*

MEDICAL SCHOOL NOTES

Dr. Albert S. Welch read a paper and gave a motion picture demonstration before the Terre Haute, Indiana, Academy of Medicine on "Ectopic Heart" recently.

Dr. Caryl Ferris read a paper on "Diabetes" before the Jasper County Medical Society, Joplin, Missouri, recently.

Dr. O. T. Blanke, '24, Joplin, Missouri, and Dr. Adolph Boese, '24, Coffeyville, Kansas, attended the recent meeting of the American Association for Goitre, which was held in Kansas City.

Dr. and Mrs. James Danglade, '26, are the proud parents of a baby boy, born April 7, 1931.

Dr. P. T. Bohan recently attended the meeting of the American College of Physicians which was held in Baltimore, Maryland.

Dr. F. C. Helwig talked before the Clay County Medical Society, Clay Center, Kansas, in March on "Coronary Disease."

Dr. H. M. Gilkey read a paper before the Butler County Medical Society at El Dorado, Kansas, on "Treatment of Nutritional Diseases of Children."

Robert Murray Isenberger, Jr., born February 17, 1931, is the son of Dr. and Mrs. Robert M. Isenberger.

Dr. Thomas G. Orr read a paper before the Wyandotte County Medical Society, Kansas City, Kansas, on March 3rd on "Water and Salt Balance."

RELAXATIVES

A Boston physician says that in fifty years kissing will be a thing of the past and, in fifty years, we for one, won't care.—New York Evening Post.

✣ ✣ ✣

The mosquito, unlike a doctor, presents his bill before he works on you.—Florida Times-Union.

✣ ✣ ✣

They had to give my aunt Tillie ether twice for one operation. The first time was for the operation, and the second was to stop her from talking about it. —Judge.

✣ ✣ ✣

The nose, a physician says, is a feature which never changes. Unless, of course, it's poked once too often into other people's business.—Life.

✣ ✣ ✣

The truth-in-advertising movement has made gigantic strides. A society bootlegger in Philadelphia made his deliveries in packages labeled "Floor Paint."—Detroit News.

THE JOURNAL
of the
Kansas Medical Society

W. E. McVEY, M. D. - - - Editor

ASSOCIATE EDITORS—L. W. SHANNON, L. B. SPAKE, P. S. MITCHELL, O. P. DAVIS, J. T. AXTELL, J. F. GSELL, CC. STILLMAN, ALFRED O'DONNELL, H. O. HARDESTY, I. B. PARKER, C. H. EWING, W. F. FEE.

Subscription Rates: $2.00 per year. 20c single copy. Advertising rates furnished promptly on application.

LIST OF OFFICERS—President, E. C. Duncan, Fredonia; Vice President, J. B. Carter, Wilson; Secretary, J. F. Hassig, Kansas City; Treasurer, Geo. M. Gray, Kansas City.

COUNCILORS—First District, L. W. Shannon, Hiawatha; Second District, L. B. Spake, Kansas City; Third District, P. S. Mitchell, Iola; Fourth District, O. P. Davis, Topeka. Fifth District, J. T. Axtell, Newton; Sixth District, J. F. Gsell, Wichita; Seventh District, C. C. Stillman, Morganville; Eighth District, Alfred O'Donnell, Ellsworth; Ninth District, H. O. Hardesty, Jennings; Tenth District, I. B. Parker, Hill City Eleventh District, C. H. Ewing, Larned; Twelfth District, W. F. Fee, Meade.

For some years it has been a custom to make the May number of the Journal the "Medical School Number." This year practically all of the space is being utilized by the members of the faculty. They are giving us a splendid series of papers and there is no question but this sort of cooperation will be highly appreciated by the members of the Society.

THE CRIPPLED CHILDREN'S LAW OF KANSAS

The last legislature enacted a law for the care of the indigent crippled children of the state which should appeal to every physician in the state. It affords the medical profession an unusual opportunity, and the responsibility for its success will depend largely on the kind of support given it by the rank and file of the physicians of the state. The average doctor may be uninterested in it or may regard it solely as a means of furthering his own practice and thus rapidly bring the law into disrepute, or he may, and undoubtedly will, submerge all self interest and pave the way for providing every physically handicapped indigent child every chance to become an independent, self-respecting member of society.

The provisions of the law are unusually thorough and seem to provide for every contingency that may arise in this problem. It has a remarkably broad interpretation of the meaning of the crippled child, embracing all persons under twenty-one who have a physical defect or disease that can be improved or removed by appropriate medical or surgical treatment. It provides the finances to defray the expense of such treatment, each county being assessed one-tenth mill for every taxable dollar to comprise a separate fund to be used only for the care of crippled children of that county. It includes compensation to the doctor as well as to the hospital. It provides for a commissioner to carry out the provisions of the law and to see that the afflicted child gets into the hands of none but competent specialists and in only those institutions that have fully adequate facilities to give the best service. It also provides safeguards so that only deserving indigent children may reap the benefits of this law. Furthermore, it opens the way for the care of such patients in various sections of the state as soon as adequate facilities and competent personnel become available.

While the law has supplied the governmental machinery for the care of the crippled child, every physician knows that much has to be done before its full benefits can be secured. It is estimated that over 5,000 children will become eligible for this treatment. Yet there is no well organized children's hospital in the entire state that can provide the variety of services such as can be secured in some of our neighboring states. There is at the hospital of the state medical school a children's ward with a maximum capacity of fifty patients and a similar ward in only one other hospital

in the state. There should be a well equipped, specially designed children's hospital with at least three times as many beds, including a brace shop, a complete physiotherapy unit, a department of occupational therapy and a special school for the education of patients who may be kept months from school. Only with such supplementary departments and equipment can the hospital be thoroughly efficient, but this is necessarily expensive and can be erected and managed most economically where an organization of well qualified specialists already exists, such as in the medical schools of the state universities. The states of Oklahoma, Minnesota, Wisconsin, Iowa and Indiana have provided such children's units at their respective medical schools and the medical profession should urge that Kansas do the same with its medical school. Failure of the law may result from inadequate facilities rather than from the law itself or the attitude of the doctors, and all physicians should be informed of this situation and use their influence to change this lack of preparedness.

The medical profession should not only be awake to the opportunities of this law but should be cognizant of the danger to this law if a few improperly qualified physicians should succeed in using the law to further their own private interests or if the cultists should succeed in their endeavors to be permitted to carry on their unrecognized practices on children under the protection of this law. In other words, two obligations rest upon every physician interested in his community and in the crippled children of the state, first, to give unstinting support to the crippled children's commission in limiting the care of their wards to only those organizations that are adequately equipped and have competent specialists on their staffs and, second, to use every influence to secure more adequate and larger facilities for such care, either at the state medical school or at some other large center or at several places.

H. R. Wahl.

SOCIETIES

The Miami County Medical Society met in regular sesion at the Paola Country Club Tuesday evening, April 14, having as their guests the members of the Franklin County Society. Some of the Ottawa boys reported early and played a round of golf, after which dinner was served at the club to about forty members and guests.

The program was opened by Dr. C. E. Virden of Kansas City, Mo., who went into detail on cholecystography, showing some extremely interesting plates covering minutely the differential diagnoses of diseases of the gall bladder.

Dr. Eugene Hamilton also of Kansas City, Mo., followed with a highly interesting survey of surgical diseases of the gall bladder and neighboring anatomy, demonstrating some specimens of rare pathological interest. The high point in the doctor's talk was the attention to the differential diagnoses and the careful estimate of the vital resistance of patients before surgical intervention.

General discussion of the problems confronting the general practitioner followed before adjournment.

P. A. Pettit, Secretary.

FORD COUNTY MEDICAL SOCIETY

The March meeting was held in The Protestant Christian Hospital at which time a luncheon was served to the members and visitors, by the management of the hospital.

The principal speaker was Dr. Paul F. Stookey, of Kansas City, Mo., who gave a helpful talk on "Smallpox."

Visitors present were: Paul F. Stookey, Kansas City, Mo.; C. B. Francisco, Kansas City, Mo.; Wm. F. Fee, Meade, Kansas; M. C. Jenkins, Pratt, Kansas; L. G. Blackmer, Liberal, Kansas; Fred L. Holcomb, Coldwater, Kansas; R. A. J. Shelley, Coldwater, Kansas; G. Kenneth Lewis, Garden City, Kansas.

A committee on medical care of indigent persons in Ford and Gray counties reported contracts by which Ford County pays $2,200.00 yearly and Gray County pays $200.00 and the work in the two counties is done by the members of the society.

The neighboring physicians were asked to attend the April meeting and hear Dr. Evan S. Connell of Kansas City, Mo. Dr. Connell gave an illustrated talk on "The nasal sinuses as a factor in systemic disease." Some very interesting cases were reported, and a new slant on these sinuses was presented.

Visitors present were: Evan S. Connell, Kansas City, Mo.; R. M. Troup, Garden City, Kan.; H. H. Miner, Ulysses, Kan.; F. E. Dargatz, Kinsley, Kan.

W. F. PINE, Secretary.

WANTED—Doctor to locate in Bogue, Kansas, town of two hundred fifty, large surrounding territory, no doctor close, good drug store opening here. Address R. R. Kirkpatrick, Bogue, Kansas.

FOR SALE—Eight thousand dollar practice in east central Kansas town of five hundred. Accredited high school, good churches, extra large trade territory, collections ninety per cent in past five years. Introduction given with strictly modern home, office equipment and large stock of drugs. Price three thousand dollars, terms. Leaving to specialize. Address A-555, care Journal.

WANTED—Doctor, experienced wants location. Established practice, good farming community, in modern town. No real estate. Address A-556, care Journal.

MORSE WAVE GENERATOR for sale; works and looks like new; $135.00 takes it. Address Dr. F. E. Dargatz, Box 217, Kinsley, Kansas.

WANTED—Salaried Appointments for Class A physicians in all branches of the Medical Profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan, Chicago. Established 1896. Member The Chicago Association of Commerce.

DIABETICS

have palatable

Starch-free Bread

when you prescribe

Listers

DIETETIC FLOUR

Self-rising — contains no starch, no gluten

Ask for nearest Depot or order direct

LISTER BROS. Inc. 41 East 42nd Street NEW YORK, N. Y.

The Only

BREAST MILK

Adaptation

of its kind in the world

ANALYSIS

Comparative Analysis of S. M. A. and Breast Milk

Chemical and Physical Analysis	S. M. A.	Breast Milk
Fat	3.5-3.6%	3.59
Protein	1.3-1.4%	1.23-1.5
Carbohydrate	7.3-7.5%	7.37
Ash	0.25-0.30%	0.215-0.226
pH	6.8-7.0	6.97
Δ	0.56-0.61	0.56
Electrical Conductivity	0.0022-0.0024	0.0023
Specific Gravity	1.032	1.032
Caloric Value:		
per 100 c. c.	68.0	68.0
per ounce	20.0	20.0

Write for samples and literature

S.M.A.

CORPORATION

CLEVELAND, OHIO

We would like to have you try

Nonspi

For Excessive Armpit Perspiration

NONSPI destroys armpit odor and removes the cause—excessive perspiration.

This same perspiration, excreted elsewhere through the skin pores, gives no offense because of better evaporation.

We will gladly mail you Physician's testing samples.

THE NONSPI COMPANY
117 WEST 18th STREET
NEW YORK, NEW YORK

Send free NONSPI samples to:

Name.....

Street.....

City.....

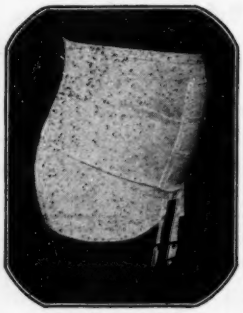
NONSPI

"A word fitly spoken—how good!"

Recently this word came from a distinguished M.D.—"The Storm has been tried and proven."

"STORM"

The New "Type N" Storm Supporter



meets demands of present styles in dress.

Long special laced back.

Extension of soft material low on hips.

Hose supporters attached.

Takes Place of Corsets

Adaptable to Pregnancy, Ptosis, Hernia, Obesity, Sacro-Iliac Relaxation, High and Low Operations, etc.

Ask for Literature

Each belt made to order in 24 hours
Originator, Owner and Maker

KATHERINE L. STORM, M.D.

1701 Diamond Street Philadelphia

June 15-26
Post-Graduate Course
and
Clinical Conference

Plan to attend a most unusual Post-Graduate Course and Clinical Conference in St. Louis, under the direction of the St. Louis Clinics.

Come and observe the work being done in St. Louis hospitals where the Conference will be held. Attend the Round Table Discussions at luncheons to be served in the various hospitals.

Let eminent physicians, surgeons and teachers help solve your problems. Gather information that you will be able to use in your everyday practice. Small registration fee.

Membership limited to 100.

Send for complete information today. Write your name on this announcement and mail it to

ST. LOUIS CLINICS

3839 Lindell Blvd. St. Louis, Mo.

THE PANOPTIK BIFOCAL

NO OTHED BIFOCAL COMBINES SO MANY BIFOCAL ADVANTAGES

Natural Visual Effect
Fused Construction
Controlled Optical Center
Unique Reading Segment
Available in Soft-Lite

A Scientific Achievement

The Panoptik Bifocal affords vision so slosely approaching th enormal vision of younger eyes that even new patients soon forget they are wearing bifocals. Vision is adjusted without consciousnes of having two corrective powers.

There is very little if any "displacement of image" at the dividing line. The use of Barium glass in the reading portion gives sharpest definition obtainable. Both surfaces of the lens are smooth and cannot collect dust. They are made in the Orthogon form.

No matter where the distance optical center is placed, the reading optical center remains approximately 3½ m/m below the dividing line an dalways coincides with the distance peripheral ray. The unique shape of the reading portion gives widest field.

Write for Treatise

RIGGS OPTICAL COMPANY

Chicago Kansas City, Missouri Salina, Kansas Pittsburg, Kansas San Francisco
Oklahoma City, Oklahoma St. Louis, Missouri Wichita, Kansas

OFFICES LOCATED IN 60 PRINCIPAL CITIES OF THE MID-WEST AND WEST

THE TROWBRIDGE TRAINING SCHOOL

Established 1917

A HOME SCHOOL for NERVOUS and BACKWARD CHILDREN

The Best in the West

Beautiful Buildings and Spacious Grounds. Equipment Unexcelled. Experienced Teachers. Personal Supervision given each Pupil. Resident Physician. Enrollment Limited. Endorsed by Physicians and Educators. Pamphlet upon Request.

650 Chambers Bldg. **E. HAYDN TROWBRIDGE, M.D.** **Kansas City, Mo.**

CHRIST'S HOSPITAL

TOPEKA, KANSAS

122 Bed General Hospital, Training School for Nurses, Affiliated with Washburn College—Maternity Department an entire floor—every modern appointment.

MATERNITY—MEDICAL—SURGICAL
PHYSIOTHERAPY—HYDROTHERAPY

MARTHA E. KEATON, R.N., A.B.,
Superintendent of Nurses.

NORMAN J. RIMES,
Superintendent.

THE EVERGREEN SANITARIUM

500 Maple Avenue, Leavenworth, Kansas
For Nervous and Mental Disorders, Alcoholism and Drug Addiction

CAPACITY 26 BEDS **ALL SINGLE ROOMS**

Located on 12-acre plot, one and one-half miles from center of City of Leavenworth, on highway No. 7. Bus service every 20 minutes. Pleasant shaded lawns. Nice, quiet place for nervous people who desire rest.

Address Evergreen Sanitarium in regard to rates.

MRS. CLARA G. GODDARD, Supt. and Matron
Dr. A. L. Suwalsky, Physicians

POST-GRADUATE SCHOOL OF SURGICAL TECHNIQUE INC.

2512 Prairie Avenue (opposite Mercy Hospital) Chicago, Illinois

A School of **Surgical Technique** conducted by Experienced practicing Surgeons

1. **General Surgery:** Two weeks' (100 hours) course of intensive instruction and practice in surgical technique combined with clinical demonstrations (for practicing surgeons.)
2. **General Surgery and Specialties:** Three month's course comprising: (a) review in anatomy and pathology; (b) demonstration and practice in surgical technique; (c) clinical instruction by faculty members in various hospitals, stressing diagnosis, operative technique and surgical pathology.
3. **Special courses:** Orthopedic and traumatic surgery; gynecology and radiation therapy; eye, ear, nose and throat, thoracic, genito-urinary and goiter surgery; Bronchoscopy, etc.

All courses continuous throughout the year.
Detailed information furnished on request

DR. ALEXANDER B. MAGNUS, Med. Dir

◆ CHICAGO SANITARIUM ◆

FOR THE CARE OF NERVOUS AND MENTAL DISORDERS AND ALCOHOLISM

Also Drug Addiction Intelligently Handled

EVERY FACILITY for care and thorough investigation as well as management of Neuro-Psychiatric problems, including kindred physical infirmities pertaining thereto, is available in the new sound-proof building. On admission every case is carefully studied from every angle; routine dental examination is included. Laboratory for routine and special tests is available. Facilities are had for cases for over night stay following a spinal puncture; X-ray is available and an elaborate hydro- physio and mechanotherapy is had.

WHERE HOME-LIKE SURROUNDINGS is a benefit to the patient, one such building is available. Varied entertainment is furnished by motion pictures, radios, books and musicians. The Sanitarium is conveniently located near Lake Michigan and only a few minutes from the Chicago loop, where excellent hotel facilities are available to relatives or friends of out-of-town patients.

2828 Prairie Avenue, Chicago, Ill. **Phone Victory 5600**

KANSAS MEDICAL SOCIETY

CHARTERED BY THE TERRITORIAL LEGISLATURE OF KANSAS, FEBRUARY 19, 1859

President—E. C. DUNCAN, M.D., Fredonia

Vice-President—J. B. CARTER, M.D., Wilson

Secretary—J. F. HASSIG, M.D., Kansas City **Treasurer—GEO M. GRAY, M.D., Kansas City**

Executive Committee of Council

E. C. Duncan ..... Fredonia
J. F. Hassig ..... Kansas City
Geo. M. Gray ..... Kansas City
O. P. Davis ..... Topeka

Defense Board

O. P. Davis, Chairman ..... Topeka
W. F. Fee ..... Meade
C. C. Stillman ..... Morganville

Bureau of Public Relations

E. C. Duncan ..... Fredonia
J. F. Hassig ..... Kansas City
Geo. M. Gray ..... Kansas City
O. P. Davis ..... Topeka
Earle G. Brown ..... Topeka
W. S. Lindsay ..... Topeka
L. F. Barney ..... Kansas City
W. E. McVey ..... Topeka

Committee on Public Health and Education

Earle G. Brown ..... Topeka
J. T. Axtell ..... Newton
J. D. Pettit ..... Arcadia
W. F. Bernstorf ..... Pratt
R. T. Nichols ..... Hiawatha
H. E. Haskins ..... Kingman

Committee on Public Policy and Legislation

W. S. Lindsay ..... Topeka
F. W. O'Donnell ..... Junction City
E. N. Martin ..... Clay Center
E. C. Duncan, Ex-officio ..... Fredonia
J. F. Hassig, Ex-officio ..... Kansas City

Committee on School of Medicine

L. F. Barney ..... Kansas City
L. G. Allen ..... Kansas City
H. F. Hyndman ..... Wichita
M. C. Martin ..... Newton
E. S. Edgerton ..... Wichita

Committee on Hospital Survey

Geo. M. Gray ..... Kansas City
David W. Basham ..... Wichita
Alfred O'Donnell ..... Ellsworth

Committee on Medical History

W. E. McVey ..... Topeka
W. S. Lindsay ..... Topeka
O. D. Walker ..... Salina

Committee on Scientific Work

J. F. Hassig ..... Kansas City
H. T. Groody ..... Manhattan
H. L. Chambers ..... Lawrence

Committee on Necrology

B. R. Riley ..... Benedict
W. E. McVey ..... Topeka
J. F. Hassig ..... Kansas City

Committee on Stormont Medical Library

Wm. C. Menninger ..... Topeka
W. F. Bowen ..... Topeka
J. L. Lattimore ..... Topeka

COUNTY SOCIETIES

Members of the Component County Societies are members of the Kansas Medical Society. Physicians residing in counties where no County Society exists may join the society of an adjoining county. Physicians residing where no County Society exists, who are members of a district or other independent society approved by the Council, may be admitted to membership.

ANNUAL DUES due on or before February 1st of each year.

Dues should be paid to the Secretary of the Component County Society, or, if not a member of a County Society, to the Secretary of the Kansas Medical Society.

OFFICERS FOR 1931

COUNTY	PRESIDENT	SECRETARY
ALLEN	Jas. T. Reid, Iola	P. S. Mitchell, Iola
ANDERSON	W. D. Pitman, Westphalia	J. A. Milligan, Garnett
ATCHISON	Lee Cowan, Atchison	T. E. Horner, Atchison
BARTON	T. J. Brown, Hoisington	L. R. McGill, Hoisington
BOURBON	R. Y. Strohm, Ft. Scott	R. L. Gench, Ft. Scott
BROWN	L. W. Shannon, Hiawatha	A. H. Hayes, Sabetha
BUTLER	R. W. Moore, Eureka	C. C. Brown, El Dorado
CENTRAL KANSAS	H. S. O'Donnell, Ellsworth	F. K. Meade, Hays
CHEROKEE	R. C. Lowdermilk, Galena	W. H. Iliff, Baxter Springs
CLAY	C. C. Stillman, Morganville	F. R. Croson, Clay Center
CLOUD	A. M. Townsdin, Jamestown	R. E. Weaver, Concordia
COFFEY	H. T. Salisbury, Burlington	A. B. McConnell, Burlington
COWLEY	J. H. Douglas, Arkansas City	H. A. Mercer, Arkansas City
CRAWFORD	F. H. Rush, Pittsburg	C. B. Newman, Pittsburg
DECATUR-NORTON	G. A. Van Diest, Prairie View	W. Stephenson, Norton
DICKINSON	L. G. Heines, Abilene	Ray G. Gomel, Abilene
DONIPHAN	A. E. Cordonier, Troy	W. M. Boone, Highland
DOUGLAS	A. J. Anderson, Lawrence	L. S. Powell, Lawrence
ELK	R. C. Harner, Howard	F. L. DePew, Howard
FINNEY	G. R. Hastings, Lakin	O. W. Miner, Garden City
FORD	Jos. W. Spearing, Cimarron	W. F. Pine, Dodge City
FRANKLIN	G. G. Kreeger, Richmond	H. K. B. Allebach, Ottawa
HARPER	A. E. Walker, Anthony	E. E. Hartman, Anthony
HARVEY	J. H. Enns, Newton	F. G. Bartel, Newton
JACKSON	E. W. Reed, Holton	C. A. Wyatt, Holton
JEWELL	J. E. Hawley, Burr Oak	C. W. Inge, Formosa
JOHNSON	H. R. Wahl, Kansas City	D. E. Bronson, Olathe
KINGMAN	C. W. Longenecker, Kingman	H. E. Haskins, Kingman
LABETTE	C. S. McGinnis, Parsons	J. T. Naramore, Parsons
LEAVENWORTH	A. J. Smith, Leavenworth	H. J. Stacy, Leavenworth
LINCOLN	J. M. Sutton, Lincoln	G. M. Anderson, Lincoln
LINN	L. D. Mills, Mound City	H. L. Clark, La Cygne
LYON	M. A. Finley, Emporia	C. E. Partridge, Emporia
McPHERSON	J. H. Powers, Little River	A. M. Lohrentz, McPherson
MARION	L. S. Wagar, Florence	E. H. Johnson, Peabody
MARSHALL	R. L. McAllister, Marysville	H. Haerle, Barysville
MEADE-SEWARD	Geo. S. Smith, Liberal	E. Trekell, Liberal
MIAMI	Jos. Fowler, Osawatomie	P. A. Pettit, Paola
MITCHELL	H. A. Hope, Hunter	Martha Madtson, Beloit
MONTGOMERY	C. E. Grigsby, Coffeyville	J. A. Pinkston, Independence
NEMAHA	F. S. Deem, Oneida	S. Murdock, Jr., Sabetha
NEOSHO	J. A. Butin, Chanute	A. M. Garton, Chanute
OSBORNE	J. D Johnson, Alton	S. J. Schwaup, Osborne
OTTAWA	L. M. Hinshaw, Bennington	C. M. Vermillion, Minneapolis
PAWNEE	J. H. Tapscott, Rozel	C. H. Ewing, Larned
PRATT	J. R. Campbell, Pratt	E. M. Ireland, Coats
RENO	H. L. Scales, Hutchinson	C. A. Boyd, Hutchinson
REPUBLIC	M. D. McComas, Courtland	H. E. Robbins, Belleville
RICE	J. H. Staatz, Bushton	C. W. Haines, Little River
RILEY	J. D. Colt, Manhattan	B. A. Nelson, Manhattan
RUSH-NESS	D. H. Nothdurft, Otis	Justin A. Blount, Burdett
SALINE	W. R. Dillingham, Salina	L. O. Nordstrom, Salina
SEDGWICK	H. N. Tihen, Wichita	Frances H. Schiltz, Wichita
SHAWNEE	Geo. H. Allen, Topeka	E. G. Brown, Topeka
SMITH	D. W. Relihan, Smith Center	V. E. Watts, Smith Center
STAFFORD	F. W. Tretbar, Stafford	L. E. Mock, St. John
SUMNER	R. C. McIlhenny, Conway Springs	I. H. Dillon, Wellington
WASHINGTON	H. D. Smith, Washington	W. M. Earnest, Washington
WILSON	B. R. Riley, Benedict	E. C. Duncan, Fredonia
WOODSON	A. C. Dingus, Yates Center	H. A. West, Yates Center
WYANDOTTE	R. T. Lucas, Kansas City	L. B. Gloyne, Kansas City

New (Third) Revised and Enlarged Edition

BALYEAT'S

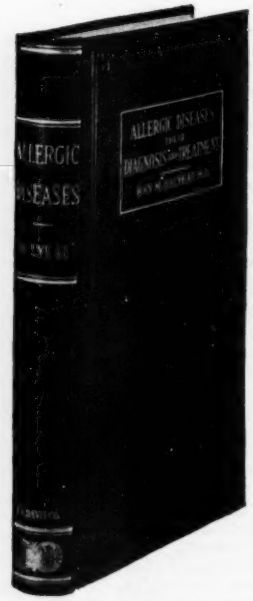
ALLERGIC DISEASES

Their Diagnosis and Treatment

A Practical Treatise of Allergic Diseases—Asthma, Seasonal Hay Fever, Perennial Hay Fever, Migraine, Urticaria, and Certain Forms of Eczema and Chronic Colitis

By

RAY M. BALYEAT, M.A., M.D., F.A.C.P.



Lecturer on Allergic Diseases, University of Oklahoma Medical School; Director of Balyeat Hay Fever and Asthma Clinic, Oklahoma City, Oklahoma.

Three hundred and ninety-five pages, 6x9, illustrated with 87 engravings, line drawings and charts, and 4 colored plates. Third Revised and Enlarged Edition. Price, cloth binding, $5.00.

Prepared primarily for the practitioner and the student of medicine, the fundamental principles of allergy are fully discussed. Detailed methods for determining the cause of hay fever and asthma, and the practical application of the preventive, palliative and curative measures, are clearly given. It is profusely illustrated, which makes it easily understood by one who is not a specialist.

THE MOST IMPORTANT FEATURES of the new edition are the 8 new chapters on diseases other than hay fever and asthma, due to allergy, namely, migraine, urticaria, and certain forms of eczema and colitis,—syndromes that have long perplexed the medical profession. In these chapters will be found much practical information concerning their diagnosis and treatment.

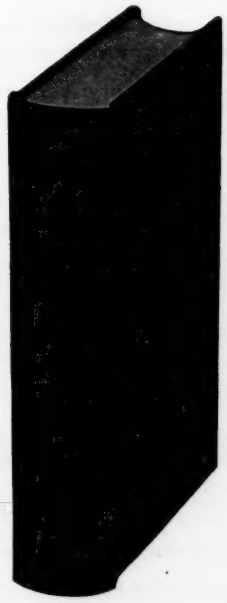
About 10 PER CENT of the population of the United States sometime in life suffer from some form of allergy. The methods of diagnosis and treatment of allergic diseases are poorly understood by the average physician. This book offers the physician a guide to the practical methods of their diagnosis and management. Dr. Balyeat has given particular attention to the methods of technique and plans of management which lend themselves most readily to application by the general practitioner. It is the work of an experienced teacher and a pioneer in the study and treatment of diseases due to allergy.

F. A. DAVIS COMPANY—Medical Publishers
Philadelphia, Pa.

You may send me a copy of the new 3rd edition of Balyeat's ALLERGIC DISEASES. Price $5.00.

Name.....**Address**.....

No Other Book on Skin Diseases Like Sutton



WHY? Because it

Contains more illustrations.

Brings the literature more nearly up-to-date.

Is more widely sold among general practitioners.

Used in more Class A Medical Schools.

The new 8th Edition has been completely revised, has several hundred new illustrations, has much new text matter and thousands of new references to the literature of the world, and above all, has been printed on thinner paper so as to make the book easy to handle, yet retaining all the characteristics that have made the previous seven editions so popular with physicians and teachers.

A Sutton's DISEASES OF THE SKIN on your shelves means that you have at hand ready for any emergency a real encyclopedia on skin diseases. Over 1400 illustrations help you to diagnose your cases. You get all the formulas used by Dr. Sutton in treating his skin disease cases. It's like being in a great skin clinic when you have this book right at your hand for immediate use. And you will use it, too. Better send for one, Doctor.

The Lancet (London):
"The first edition appeared in 1916 and quickly won recognition for itself as one of the leading dermatological textbooks. The present volume is admirable in every way. It contains nearly a thousand photographic illustrations and 11 color plates. The photographs are excellent; we know of no other published collection that can compare with them. The text is worthy of the illustrations and has been brought thoroughly up-to-date without rendering the book unwieldy. To the advanced student and practitioner, if only for its wealth of illustrations, this book should make a strong appeal, and the dermatologist will regard it as a most valuable work of reference."

SUTTON'S DISEASES OF THE SKIN

By Richard L. Sutton, M.D., Sc.D., LL.D., F.R.S. (Edin.), Professor of Diseases of the Skin, University of Kansas School of Medicine; Assistant Surgeon, U.S.N., retired; Dermatologist to Santa Fe Hospital Association, Bell Memorial Hospital, Spafford Home for Children, Nettleton and Armour Homes for the Aged, and Visiting Dermatologist to the Kansas City General Hospital, Kansas City, Mo.

8th Revised and Enlarged Edition. About 1400 pages with 1400 illustrations in the text and 11 color plates. Price, cloth, $12.00.

Cut Here and Mail Today

THE C. V. MOSBY COMPANY, (Kansas)
3523-25 Pine Boulevard, St. Louis.

Send me a copy of the 8th edition of SUTTON on DISEASES OF THE SKIN. Price, cloth, $12.00. ☐ I'll pay $4.00 per month until full amount has been paid. ☐ I'll send check in thirty days.

Name .....

Address .....

APPLICATION FOR MEMBERSHIP

To the Officers and Members of the

.....**County Medical Society**

GENTLEMEN:—I hereby make application for membership in your Society, and, if accepted as a member, I agree to support its Constitution and By-laws, to practice in accordance with the established usages of the profession, and will in no way profess adherence or give my support to any exclusive dogma or school.

1. I was born at.....on the.....day of.....1.....

2. My preliminary education was obtained at.....
(Public schools, high school or college)

.....located at.....from which I
(City and State)

graduated in the year 1.....and received the degree of.....

3. My medical education was obtained at.....
(Name of Medical College)

.....located at.....

from which I graduated in the year 1.....

4. My state certificate was issued.....
(Name of State and date of license under which you are practicing)

5. I have practiced in my present location.....years; and at the following places for the years named.....
(Name each location and give dates)

.....

6. I hold the following positions:.....
(Give college and hospital positions, insurance companies for which you are the examiner, etc.)

.....

.....

7. Specialty.....

8. Residence.....Street

9. Office.....Street

10. Office Hours.....

Respectfully, Name.....

P. O.....

County.....

State .....

NOTE.—The above information is primarily for use in the Card Index System of the County and State and for the American Medical Directory.

THE NEW MENNINGER SANITARIUM

PSYCHIATRY
at the Menninger Sanitarium
Modern Treatment of Mental Disease

NEUROLOGY
at Christ's Hospital
Diagnostic and Therapeutic Measures

NERVOUS CHILDREN
at the Southard School
Home School for Feeble Minded Children

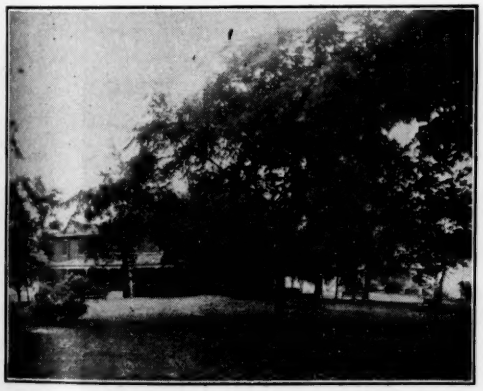
DIAGNOSIS
at the Menninger Clinic
Nervous, Mental, and Endocrine Cases

Karl A. Menninger, M.D. **C. F. Menninger, M.D.** **William C. Menninger, M.D**

TOPEKA, KANSAS

Grandview Sanitarium

KANSAS CITY, KANSAS (26th St. and Ridge Ave.)



A High Grade Sanitarium and Hospital of superior accommodations for the care of:

Nervous Diseases

Mild Psychoses

The Drug Habit

and Inebriety.

Situated on a 20-acre tract adjoining City Park of 100 acres. Room with private bath can be provided.

The City Park line of the Metropolitan Railway passes within one block of the Sanitarium. Management strictly ethical.

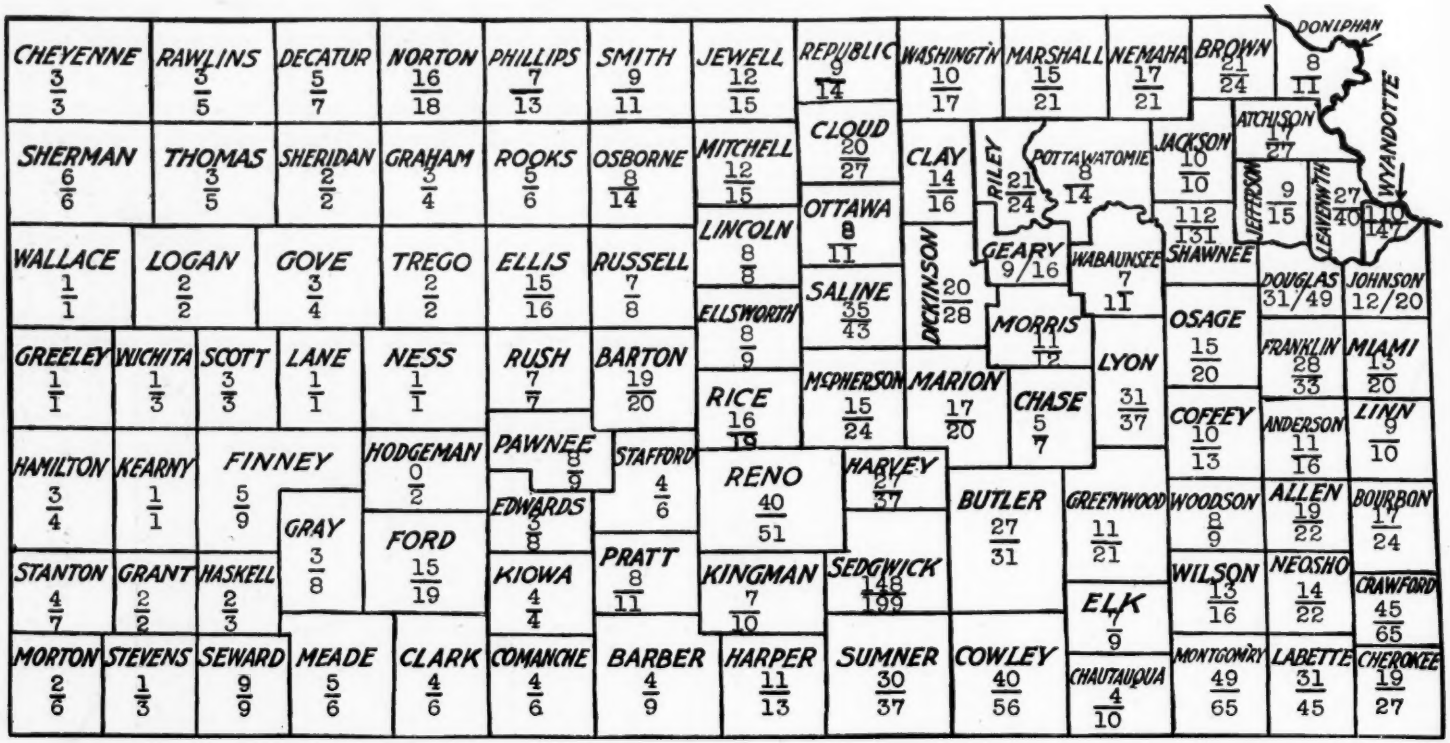
Telephone: Drexel 0019

SEND FOR BOOKLET

E. F. DeVILBISS, M.D., Supt.

OFFICE, 1124 PROFESSIONAL BLDG., KANSAS CITY, MO.

KANSAS



Circulation distribution. The figures above the line repres ent the number of subscribers and the figures below the line the number of registered physicians in the county.